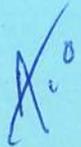


**STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION**

FROM:  Andrew O'Sullivan
Wetlands Program Manager

DATE: August 30, 2021

AT (OFFICE): Department of
Transportation

SUBJECT: Dredge & Fill Application
Thornton M325-1

Bureau of
Environment

TO: Karl Benedict, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT Bureau of Environment for the subject minimum impact project. This project is classified as minimum in Env-Wt 407.03(a)- Jurisdictional Area Size Thresholds. The project is located along US Route 3 in the Town of Thornton, NH. The proposed work will rehabilitate a 36" RCP pipe (Tier I, 0.05 Sq. Mi. crossing) using slipline methods.

This project was reviewed at the Natural Resource Agency Coordination Meeting on June 16, 2021. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: <http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm>.

NHDOT anticipates and request that this project be reviewed and permitted by the Army Corp of Engineers through the State Programmatic General Permit process. A copy of the application has been sent to the Army Corp of Engineers.

Mitigation is not required for the project.

The lead people to contact for this project are Samantha Fifield, District 3 (603-524-6667 or Samantha.D.Fifield@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-0556 or Andrew.O'Sullivan@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #655304) in the amount of \$400.

If and when this application meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

AMO:amo

cc:

BOE Original

Town of Thornton (4 copies via certified mail)

Pemigewasset River Local Advisory Committee (1 copies via certified mail)

David Trubey, NH Division of Historic Resources (Cultural Review Within)

Carol Henderson, NH Fish & Game (via electronic notification)

Maria Tur, US Fish & Wildlife (via electronic notification)

Beth Alafat & Jeanie Brochl, US Environmental Protection Agency (via electronic notification)

Michael Hicks & Rick Kristoff, US Army Corp of Engineers (via electronic notification)

Kevin Nyhan, BOE (via electronic notification)

S:\Environment\PROJECTS\Thornton\M325-1\Wetlands\WETAPP - District 3.doc



STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division/Land Resources Management
Wetlands Bureau
[Check the Status of your Application](#)



RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: NH Department of Transportation **TOWN NAME:** Thornton

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the [Waiver Request Form](#).

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))	
Please use the Wetland Permit Planning Tool (WPPT) , the Natural Heritage Bureau (NHB) DataCheck Tool , the Aquatic Restoration Mapper , or other sources to assist in identifying key features such as: priority resource areas (PRAs) , protected species or habitats , coastal areas, designated rivers, or designated prime wetlands.	
Has the required planning been completed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the property contain a PRA? If yes, provide the following information:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> • Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04. 	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> • Protected species or habitat? <ul style="list-style-type: none"> ○ If yes, species or habitat name(s): <input style="width: 100px;" type="text"/> ○ NHB Project ID #: <input style="width: 100px;" type="text"/> 	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Bog?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Designated prime wetland or duly-established 100-foot buffer?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the property within a Designated River corridor? If yes, provide the following information:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> • Name of Local River Management Advisory Committee (LAC): <input style="width: 100px;" type="text" value="PRLAC"/> • A copy of the application was sent to the LAC on Month: <input style="width: 50px;" type="text" value="8"/> Day: <input style="width: 50px;" type="text" value="30"/> Year: <input style="width: 50px;" type="text" value="2021"/> 	

irm@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

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For dredging projects, is the subject property contaminated? • If yes, list contaminant: N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): 32.7 AC	
SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))	
Provide a brief description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.	
<p>The purpose of the project is to rehabilitate a 36" RCP pipe (Tier I, 0.05 Sq Mi crossing) using slipline methods. The invert of the existing pipe has eroded away throughout the length of the pipe and poses a threat to the stability of the roadway. A significant sinkhole will form under the roadway if the pipe fully collapses. Sliplining the pipe fits within District 3's limited budget and construction capabilities. The existing pipe is under a great deal of fill and is surrounded by rock retaining walls and headwalls that may have historic significance. Replacing the crossing may also impact an adjacent cemetery due to the depth of construction required. All impacts to resources are intended to be temporary. As a result of Natural Resource Agencies coordination, a rock ramp will be built at the pipe's outlet to eliminate the existing perch and allow for turtles to utilize the pipe to cross to the west side of the roadway. The addition of the rock ramp will allow for a fully compliant crossing.</p>	
SECTION 3 - PROJECT LOCATION	
Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.	
ADDRESS: US Route 3	
TOWN/CITY: Thornton	
TAX MAP/BLOCK/LOT/UNIT: NHDOT ROW	
US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: No Name Brook <input checked="" type="checkbox"/> N/A	
(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places): 43.89664° North -71.68004° West	

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))		
If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: NH Department of Transportation, Samantha Fifield		
MAILING ADDRESS: 2 Sawmill Road		
TOWN/CITY: Gilford	STATE: NH	ZIP CODE: 03249
EMAIL ADDRESS: samantha.d.fifield@dot.nh.gov		
FAX: 524-8027	PHONE: 524-6667	
ELECTRONIC COMMUNICATION: By initialing here: SDF, I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))		
<input checked="" type="checkbox"/> N/A		
LAST NAME, FIRST NAME, M.I.: [REDACTED]		
COMPANY NAME: [REDACTED]		
MAILING ADDRESS: [REDACTED]		
TOWN/CITY: [REDACTED]	STATE: [REDACTED]	ZIP CODE: [REDACTED]
EMAIL ADDRESS: [REDACTED]		
FAX: [REDACTED]	PHONE: [REDACTED]	
ELECTRONIC COMMUNICATION: By initialing here [REDACTED], I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))		
If the owner is a trust or a company, then complete with the trust or company information.		
<input type="checkbox"/> Same as applicant		
NAME: NH Department of Transportation, Andrew O'Sullivan		
MAILING ADDRESS: 7 Hazen Drive, PO Box 483		
TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03302
EMAIL ADDRESS: andrew.O'Sullivan@dot.nh.gov		
FAX: 271-7199	PHONE: 271-3226	
ELECTRONIC COMMUNICATION: By initialing here AMO, I hereby authorize NHDES to communicate all matters relative to this application electronically.		

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):

The existing pipe outlet is currently perched so it does not readily allow for aquatic organism passage 904.01(a)(3) or 904.08 (2)(c). Sliplining the pipe will not eliminate the perch. However, rocks will be placed at the outlet to provide a traversable ramp for organisms, such as turtles, to enter into the pipe. Also, corrugated plastic pipe will be used for the slipline to facilitate an organism's ability to traverse the pipe to the upstream side. With these improvements, this crossing will be in full compliance with Env-Wt 904.01 and Env-Wt 904.08.

This crossing has no history of flooding. An HY8 analysis was performed to compare this culvert's capacity pre and post slipline. Results suggest that the culvert can pass the 50-year (and 100-year) storm without significant increases in outlet velocity. Sliplining the pipe will not cause upstream or downstream flooding.

Env-Wt 400: The site was delineated by Sarah Large and Deidra Benjamin on 5/12/2021 in accordance with Env-Wt 406. Temporary impacts to Riverine Intermittent Streambed Cobble-Gravel/Sand (R4SB34) and permanent impacts to Riverine Intermittent Streambed Sand (R4SB4)

Env-Wt 500: This project is applicable under a maintenance of public highway infrastructure

Env-Wt 600: N/A, this is not a project in coastal lands or tidal waters

Env-Wt 700: N/A, there are no Prime Wetlands in the project area

Env-Wt 900: The stream is determined a Tier 1 stream under 904.03 and is rehabilitation through slip line under 904.08.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#) and the [Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet](#). For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the [Avoidance and Minimization Checklist](#), the [Avoidance and Minimization Narrative](#), or your own avoidance and minimization narrative.

*See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation [pre-application meeting](#) must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: 6 Day: 16 Year: 2021

N/A - Mitigation is not required

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: I confirm submittal.

N/A – Compensatory mitigation is not required

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/ivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Scrub-shrub Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Emergent Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Wet Meadow			<input type="checkbox"/>			<input type="checkbox"/>
	Vernal Pool			<input type="checkbox"/>			<input type="checkbox"/>
	Designated Prime Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Duly-established 100-foot Prime Wetland Buffer			<input type="checkbox"/>			<input type="checkbox"/>
Surface Water	Intermittent / Ephemeral Stream	15	8	<input type="checkbox"/>	209	39	<input type="checkbox"/>
	Perennial Stream or River			<input type="checkbox"/>			<input type="checkbox"/>
	Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - River			<input type="checkbox"/>			<input type="checkbox"/>
Banks	Bank - Intermittent Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Bank - Perennial Stream / River			<input type="checkbox"/>			<input type="checkbox"/>
	Bank / Shoreline - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
Tidal	Tidal Waters			<input type="checkbox"/>			<input type="checkbox"/>
	Tidal Marsh			<input type="checkbox"/>			<input type="checkbox"/>
	Sand Dune			<input type="checkbox"/>			<input type="checkbox"/>
	Undeveloped Tidal Buffer Zone (TBZ)			<input type="checkbox"/>			<input type="checkbox"/>
	Previously-developed TBZ			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Tidal Water			<input type="checkbox"/>			<input type="checkbox"/>
TOTAL		15	8		209	39	

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

MINIMUM IMPACT FEE: Flat fee of \$400.

NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION: Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions).

MINOR OR MAJOR IMPACT FEE: Calculate using the table below:

Permanent and temporary (non-docking): SF × \$0.40 = \$

Seasonal docking structure: SF × \$2.00 = \$

Permanent docking structure: SF × \$4.00 = \$

Projects proposing shoreline structures (including docks) add \$400 = \$

Total = \$ 400

The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$ 400

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DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)

Indicate the project classification.

<input checked="" type="checkbox"/> Minimum Impact Project	<input type="checkbox"/> Minor Project	<input type="checkbox"/> Major Project
--	--	--

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: <i>SDF</i>	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: <i>SDF</i>	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
Initials: <i>SDF</i>	<p>The signer understands that:</p> <ul style="list-style-type: none"> The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: <ol style="list-style-type: none"> Deny the application. Revoke any approval that is granted based on the information. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
Initials: <i>SDF</i>	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER): <i>Samantha D. Fifield</i>	PRINT NAME LEGIBLY: Samantha D. Fifield	DATE: 8-25-21
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:
SIGNATURE (AGENT, IF APPLICABLE):	PRINT NAME LEGIBLY:	DATE:

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE: Exempt, State Agency per RSA 482-A:3I(a)(1)	PRINT NAME LEGIBLY:
TOWN/CITY:	DATE:

Keep this checklist for your reference; do not submit with your application.

APPLICATION CHECKLIST

Unless specified, all items below are required. Failure to provide the required items will delay a decision on your project and may result in denial of your application. Please reference statute RSA 482-A, Fill and Dredge in Wetlands, and the [Wetland Rules Env-Wt 100-900](#).

- The completed, dated, signed, and certified application (Env-Wt 311.03(b)(1)).
- Correct fee as determined in RSA 482-A:3, I(b) or (c), subject to any cap established by RSA 482-A:3, X (Env-Wt 311.03(b)(2)). Make check or money order payable to "Treasurer – State of NH".
- The Required Planning actions required by Env-Wt 311.01(a)-(c) and Env-Wt 311.03(b)(3).
- [US Army Corps of Engineers \(ACE\) "Appendix B, New Hampshire General Permits \(GPs\), Required Information and Corps Secondary Impacts Checklist"](#) and its required attachments (Env-Wt 307.02). This includes the [US Fish and Wildlife Service IPAC review](#) and [Section 106 Historic/Archaeological Resource review](#).
- Project plans described in Env-Wt 311.05 (Env-Wt 311.03(b)(4)).
- Maps, or electronic shape files and meta data, and other attachments specified in Env-Wt 311.06 (Env-Wt 311.03(b)(5)).
- Explanation of the methods, timing, and manner as to how the project will meet standard permit conditions required in Env-Wt 307 (Env-Wt 311.03(b)(7)).
- If applicable, the information regarding proposed compensatory mitigation specified in Env-Wt 311.08 and Chapter Env-Wt 800 - [Permittee Responsible Mitigation Project Worksheet](#), unless not required under Env-Wt 313.04 (Env-Wt 311.03(b)(8); Env-Wt 311.08; Env-Wt 313.04).
- Any additional information specific to the **type of resource** as specified in Env-Wt 311.09 (Env-Wt 311.03(b)(9); Env-Wt 311.04(j)).
- Project specific information required by Env-Wt 500, Env-Wt 600, and Env-Wt 900 (Env-Wt 311.03(b)(11)).
- A list containing the name, mailing address and tax map/lot number of each abutter to the subject property (Env-Wt 311.03(b)(12)).
- Copies of certified postal receipts or other proof of receipt of the notices that are required by RSA 482-A:3, I(d) (Env-Wt 311.03(b)(13)).
- Project design considerations required by Env-Wt 313 (Env-Wt 311.04(j)).
- Town tax map showing the subject property, the location of the project on the property, and the location of properties of abutters with each lot labeled with the name and mailing address of the abutter (Env-Wt 311.06(a)).
- Dated and labeled color photographs that:
 - (1) Clearly depict:
 - a. All jurisdictional areas, including but not limited to portions of wetland, shoreline, or surface water where impacts have or are proposed to occur.
 - b. All existing shoreline structures.
 - (2) Are mounted or printed no more than 2 per sheet on 8.5 x 11 inch sheets (Env-Wt 311.06(b)).
- A copy of the appropriate US Geological Survey map or updated data based on LiDAR at a scale of one inch equals 2,000 feet showing the location of the subject property and proposed project (Env-Wt 311.06(c)).
- A narrative that describes the work sequence, including pre-construction through post-construction, and the relative timing and progression of all work (Env-Wt 311.06(d)).

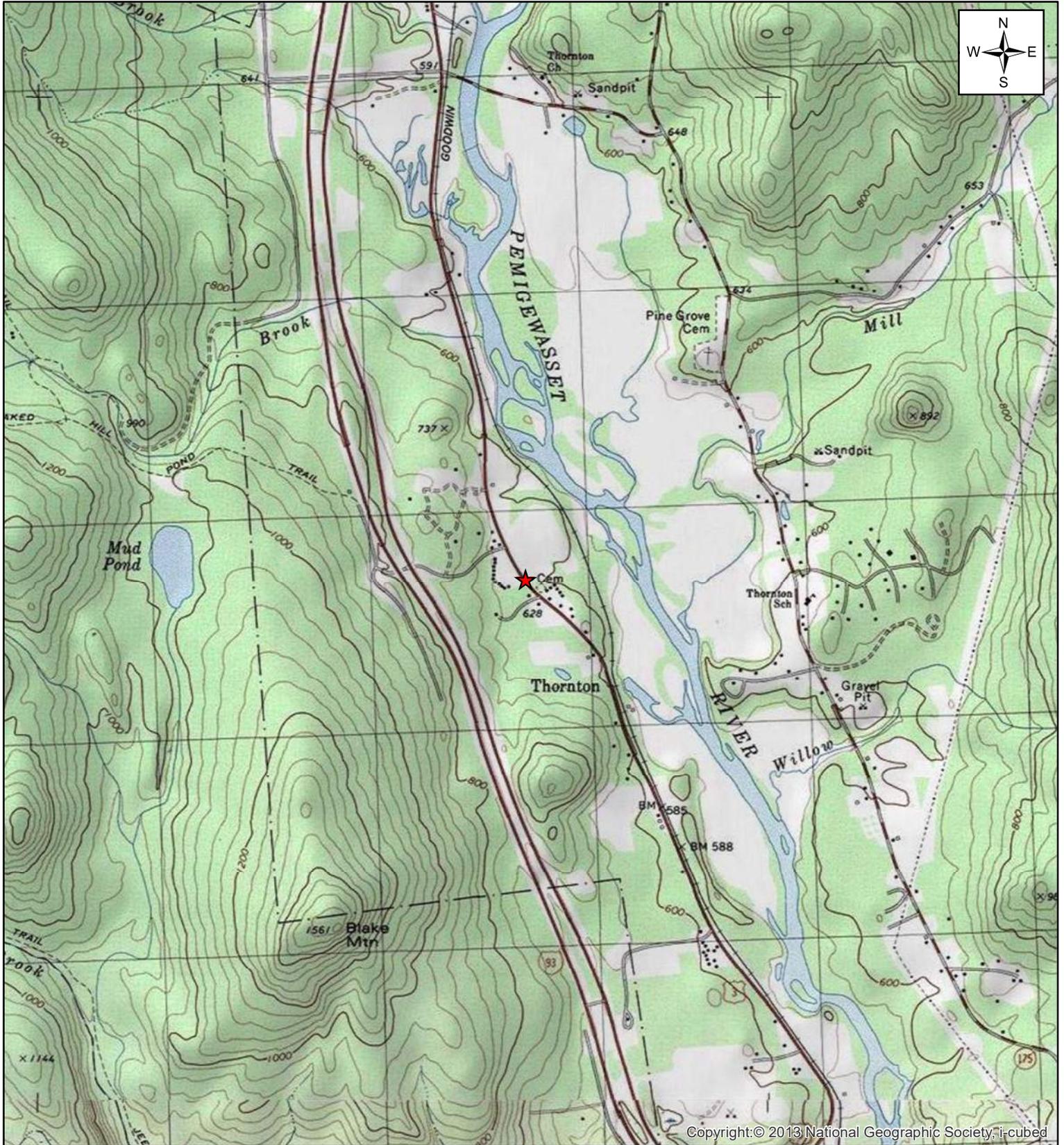
irm@des.nh.gov or (603) 271-2147

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- For all projects in the protected tidal zone, a copy of the recorded deed with book and page numbers for the property (Env-Wt 311.06(e)).
 - If the applicant is not the owner in fee of the subject property, documentation of the applicant's legal interest in the subject property, provided that for utility projects in a utility corridor, such documentation may comprise a list that:
 - (1) Identifies the county registry of deeds and book and page numbers of all of the easements or other recorded instruments that provide the necessary legal interest; and
 - (2) Has been certified as complete and accurate by a knowledgeable representative of the applicant (Env-Wt 311.06(f)).
 - The NHB memo containing the NHB identification number and results as well as any written follow-up communications such as additional memos or email communications with either NHB or NHF&G (Env-Wt 311.06(g)). See [Wetlands Permitting: Protected Species and Habitat Fact Sheet](#).
 - A statement of whether the applicant has received comments from the local conservation commission and, if so, how the applicant has addressed the comments (Env-Wt 311.06(h)).
 - For projects in LAC jurisdiction, a statement of whether the applicant has received comments from the LAC and, if so, how the applicant has addressed the comments (Env-Wt 311.06(i)).
 - If the applicant is also seeking to be covered by the state general permits, a statement of whether comments have been received from any federal agency and, if so, how the applicant has addressed the comments (Env-Wt 311.06(j)).
 - [Avoidance and Minimization Written Narrative](#) or the [Avoidance and Minimization Checklist](#), or your own avoidance and minimization narrative (Env-Wt 311.07).
 - For after-the-fact applications: information required by Env-Wt 311.12.
 - [Coastal Resource Worksheet](#) for coastal projects as required under Env-Wt 600.
 - Prime Wetlands information required under Env-Wt 700. See [WPPT](#) for prime wetland mapping.
- Required Attachments for Minor and Major Projects**
- [Attachment A: Minor and Major Projects](#) (Env-Wt 313.03).
 - [Functional Assessment Worksheet](#) or others means of documenting the results of actions required by Env-Wt 311.10 as part of an application preparation for a standard permit (Env-Wt 311.03(b)(3); Env-Wt 311.03(b)(10)). See [Functional Assessments for Wetlands and Other Aquatic Resources Fact Sheet](#). For shoreline structures, see shoreline structures exemption in Env-Wt 311.03(b)(10)).
- Optional Materials**
- [Stream Crossing Worksheet](#) which summarizes the requirements for stream crossings under Env-Wt 900.
 - Request for [concurrent processing of related shoreland / wetlands permit applications](#) (Env-Wt 313.05).

Thornton, #2020-M325-1



Copyright: © 2013 National Geographic Society, i-cubed

Map depicting project 2020-M325-1 in Thornton for rehabilitation of existing 36" culvert.

Map created by: Arin Mills on 3/24/2021

Source: S:\Environment\PROJECTS\THORNTON\2020-M324-04

Legend
★ Project Location



1:24,000





AVOIDANCE AND MINIMIZATION CHECKLIST

Water Division/Land Resources Management Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A/ Env-Wt 311.07(c)

This checklist can be used in lieu of the written narrative required by Env-Wt 311.07(a) to demonstrate compliance with requirements for Avoidance and Minimization (A/M), pursuant to RSA 482-A:1 and Env-Wt 311.07(c).

For the construction or modification of non-tidal shoreline structures over areas of surface waters without wetland vegetation, complete only Sections 1, 2, and 4 (or the applicable sections in [Attachment A: Minor and Major Projects \(NHDES-W-06-013\)](#)).

The following definitions and abbreviations apply to this worksheet:

- “A/M BMPs” stands for [Wetlands Best Management Practice Techniques for Avoidance and Minimization](#) dated 2019, published by the New England Interstate Water Pollution Control Commission (Env-Wt 102.18).
- “Practicable” means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (Env-Wt 103.62).

SECTION 1 - CONTACT/LOCATION INFORMATION		
APPLICANT LAST NAME, FIRST NAME, M.I.: NHDOT Highway Maintenance District 3		
PROJECT STREET ADDRESS: US Route 3 over No Name Brook	PROJECT TOWN: Thornton	
TAX MAP/LOT NUMBER: 43.89664 North, -71.68004 West		
SECTION 2 - PRIMARY PURPOSE OF THE PROJECT		
Env-Wt 311.07(b)(1)	Indicate whether the primary purpose of the project is to construct a water-access structure or requires access through wetlands to reach a buildable lot or the buildable portion thereof.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>If you answered “no” to this question, describe the purpose of the “non-access” project type you have proposed:</p> <p>The purpose of the project is to rehabilitate a 36" RCP pipe (Tier I, 0.05 Sq Mi crossing) using slipline methods. The invert of the existing pipe has eroded away throughout the length of the pipe and poses a threat to the stability of the roadway. A significant sinkhole will form under the roadway if the pipe fully collapses. Sliplining the pipe fits within District 3's limited budget and construction capabilities. The existing pipe is under a great deal of fill and is surrounded by rock retaining walls and headwalls that may have historic significance. Replacing the crossing may also impact an adjacent cemetery due to the depth of construction required. All impacts to resources are intended to be temporary. As a result of Natural Resource Agencies coordination, a rock ramp will be built at the pipe's outlet to eliminate the existing perch and allow for turtles to utilize the pipe to cross to the west side of the roadway. The addition of the rock ramp will allow for a fully compliant crossing.</p>		

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SECTION 3 - A/M PROJECT DESIGN TECHNIQUES		
Check the appropriate boxes below in order to demonstrate that these items have been considered in the planning of the project. Use N/A (not applicable) for each technique that is not applicable to your project.		
Env-Wt 311.07(b)(2)	For any project that proposes new permanent impacts of more than one acre or that proposes new permanent impacts to a Priority Resource Area (PRA), or both, whether any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.07(b)(3)	Whether alternative designs or techniques, such as different layouts, construction sequencing, or alternative technologies could be used to avoid impacts to jurisdictional areas or their functions and values.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(1) Env-Wt 311.10(c)(2)	The results of the functional assessment required by Env-Wt 311.03(b)(10) were used to select the location and design for the proposed project that has the least impact to wetland functions.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(3)	Where impacts to wetland functions are unavoidable, the proposed impacts are limited to the wetlands with the least valuable functions on the site while avoiding and minimizing impacts to the wetlands with the highest and most valuable functions.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.01(c)(1) Env-Wt 313.01(c)(2) Env-Wt 313.03(b)(1)	No practicable alternative would reduce adverse impact on the area and environments under the department's jurisdiction and the project will not cause random or unnecessary destruction of wetlands.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 313.01(c)(3)	The project would not cause or contribute to the significant degradation of waters of the state or the loss of any PRAs.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(b)(3) Env-Wt 904.07(c)(8)	The project maintains hydrologic connectivity between adjacent wetlands or stream systems.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	Buildings and/or access are positioned away from high function wetlands or surface waters to avoid impact.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The project clusters structures to avoid wetland impacts.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The placement of roads and utility corridors avoids wetlands and their associated streams.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
A/M BMPs	The width of access roads or driveways is reduced to avoid and minimize impacts. Pullouts are incorporated in the design as needed.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
A/M BMPs	The project proposes bridges or spans instead of roads/driveways/trails with culverts.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A

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A/M BMPs	The project is designed to minimize the number and size of crossings, and crossings cross wetlands and/or streams at the narrowest point.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 500 Env-Wt 600 Env-Wt 900	Wetland and stream crossings include features that accommodate aquatic organism and wildlife passage.	<input type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 900	Stream crossings are sized to address hydraulic capacity and geomorphic compatibility.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
A/M BMPs	Disturbed areas are used for crossings wherever practicable, including existing roadways, paths, or trails upgraded with new culverts or bridges.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
SECTION 4 - NON-TIDAL SHORELINE STRUCTURES		
Env-Wt 313.03(c)(1)	The non-tidal shoreline structure has been designed to use the minimum construction surface area over surfaces waters necessary to meet the stated purpose of the structure.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(2)	The type of construction proposed for the non-tidal shoreline structure is the least intrusive upon the public trust that will ensure safe navigation and docking on the frontage.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(3)	The non-tidal shoreline structure has been designed to avoid and minimize impacts on the ability of abutting owners to use and enjoy their properties.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(4)	The non-tidal shoreline structure has been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(5)	The non-tidal shoreline structure has been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(6)	The non-tidal shoreline structure has been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: June 16, 2021

LOCATION OF CONFERENCE: Virtual meeting held via Zoom

ATTENDED BY:

NHDOT

Sarah Large
Andrew O'Sullivan
Matt Urban
Mark Hemmerlein
Rebecca Martin
Arin Mills
Samantha Fifield
Maggie Baldwin
Cassandra Burns
Jason Abdulla
Meli Dube
Tim Mallette
Georgie Ravelli
Marc Laurin
Tobey Reynolds
Kathy Corliss
Abraham DeMaio
Jennifer Reczek

Kerry Ryan
Alan Hanscom

EPA

Jeanie Brochi

NHDES

Lori Sommer
Karl Benedict
Cheryl Bondi
Ted Diers
Ann Pelonzi

NHB

Jessica Bouchard

Federal Highway

Jaimie Sikora

The Nature Conservancy

Pete Steckler

LCHIP

Paula Bellemore

Consultants/ Public Participants

Christine Perron
Steve Halloran
Matthew Lundsted
Alec Mann

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

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(When viewing these minutes online, click on a project to zoom to the minutes for that project.)

Thornton, #2020-M325-1

Arin Mills, DOT Senior Environmental Manager, presented the project as a District 3 slipline of a 36" RCP and is a state funded and executed project. The culvert carries an un-named stream under US Route 3, a tributary to the Pemigewasset (Pemi) River. Arin explained the stream flows from the north side of Blake Mountain, and flows under I-93 approximately 1/4 mile upstream of the site. From the site it flows approximately 1/4 mile to convergence with Pemigewasset River. The stream was determined to be intermittent Tier 1 as it is not depicted on the USGS topo map or National Hydrography Dataset and based on field collection data.

A map of the aerial imagery with parcel boundaries was shown. The project is located in a rural/residential area, with no conservation lands identified adjacent. Photos were shown of the site, to include inlet/outlet and upstream/downstream of the site. The unique feature of a 'stilling pool' was described at the outlet, where water flows into and meanders around the adjacent parcel lawn. Arin also said the proposed slip line rehab was determined the most economically feasible due to the deep depth of the existing culvert below the roadbed.

Sam Fifield, District 3 Civil Engineer, described the project as rehabilitation of an existing 36" x 70' RCP with a slip line with a plastic pipe to extend the life of the crossing. Sam said slip line was the preferred rehabilitation method as the pipe is below 10' of fill at the inlet and 14' of fill at the outlet. Sam showed preliminary wetland impact plans which depict temporary impacts at both the inlet and outlet of the pipe to allow for installation. Sam described access would be from the Southwest quadrant (inlet), and that the project will not impact the Palustrine wetland in the Northwest quadrant. She also mentioned that no machinery within the stream. A description of the construction sequence will include the installation of erosion control measures, site preparation to include brush clearing/pipe cleaning/prepare framework, installation of slipline pipe and grout installation. If the ground is impacted, then turf will be reestablished. Sam further described the pipe would be lowered down from top of roadway and equipment would push the pipe into place where it would then be sealed with grout. Work will be done during no flow conditions in the late summer/early fall and grass replanting would be conducted as needed. The crossing's hydraulics (existing and proposed) were evaluated using HY-8. The flows used in the analysis were calculated using the Rational Method. Modern rainfall intensities, from the Northeast Regional Climate Center were used to determine peak flows. The calculations show no significant change to either the inlet control depth or outlet velocity with the proposed slip line from the existing conditions. The increased elevation at the inlet, due to the slipline, does not flood out adjacent properties.

Arin further described the results of the environmental review to include the stream as 1st order, a Tier 1 crossing of 32-acre drainage area and no previous permits. The project is on the edge of the Designated River boundary for the Pemi and coordination with the Local Advisory Committee has asked if the project accounted for a warming climate. Arin further said she met with the entire Conservation Commission onsite and did not result in concerns for the project. The NHB review resulted in Wood turtle and Cobblestone tiger beetle. Carol H (NHFG) provided comment ahead of the meeting resulted in a request for roughening of the pipe and a request to eliminate the perch by backwatering as well as request the work be conducted in the summer/early fall. Arin asked that we further this discussion on perch elimination in the agency comments. No concerns for the Tiger beetle. No Priority Resource Areas are within the project area. The project has been determined to be within a FEMA FMIS Map designated 100-year floodplain; however, Sam discussed conducting an evaluation of the River's floodplain elevation using LIDAR contouring, where she determined a 30' vertical difference between the edge of the Pemigewasset River Floodplain elevation and the crossing's invert elevation. Arin described a consistency letter was generated under the 4(d) rule for the Northern long-eared bat. Section 106 evaluation for potential impacts to historic properties has determined no potential to cause effect and documentation will be provided with the application. No SADES or fish data was available for the site.

Sarah L also clarified that she spoke with an adjacent landowner who confirmed that the stream does often dry completely out. She also reiterated the hydraulics show both the proposed and existing pipes will pass both the Q50 and Q100. She also was looking to get confirmation that the stream classification would remain as a Tier 1 under 904.08 despite the location being depicted within the 100-year FEMA Floodplain. Karl B agreed the stream could be classified as a Tier 1 and the application can include a request narrative to downgrade to Tier 1 under 904.08. Karl asked if the pipe had previously been sliplined and Sam confirmed it had not and Karl said that would allow it to be consistent with 904.01. He further asked to confirm the rehab would have no impacts on the upstream properties and Sam confirmed through her hydraulics calculations it would not and Karl asked that be included in the application. Karl further said the backwatering as recommended by NHFG could be accomplished with a weir under 904.01 to address the perch. Sarah commented that the Department feels backwatering was not suitable for this site due to the steep grade of the pipe and the intermittent stream as backwatering would be challenging to meet and the species it would be benefiting. Karl asked if Pete S (TNC) could speak to this from a wildlife perspective since Carol was not in attendance. Pete suggested the possible hand placement of flat stones at the outlet to match the invert elevation would help to improve wildlife passage. Sarah said she has elevations taken in the field that confirm the cascade currently existing and may help with development of plan for placement of stones. Karl agreed this would be a suitable solution to address the perched condition while benefiting wildlife passage.

Lorie S confirmed the installation of rocks at the outlet to address the perch would not trigger mitigation for this Tier 1. Matt U asked for confirmation that the permanent impacts for placement of these stones would be self-mitigating and Karl agreed that mitigation would not be required and can be shown as permanent impacts on the plans. Pete S suggested photos of the stones be provided after construction to showcase the design in improving wildlife passage. Sarah noted that photo would be provided as part of the standard requirement for photos after project completion. Geanie B had no additional comments.

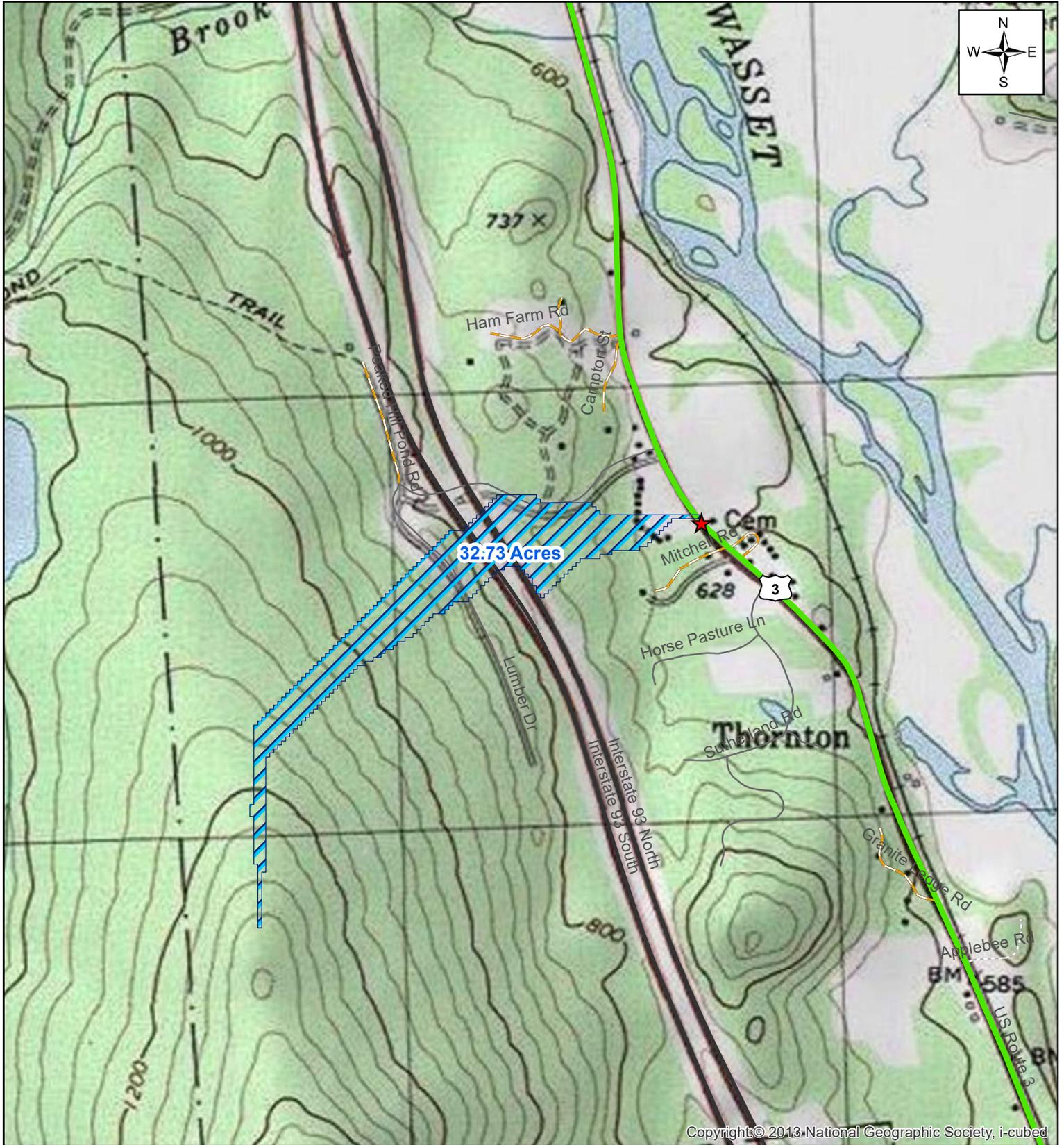
This project has not been previously discussed at the Monthly Natural Resource Agency Coordination Meeting.

Tilton, #2021-M313-1

Arin Mills, NHDTO Senior Environmental Manager, and Samantha Fifield, District 3 Civil Engineer, presented the slope rehabilitation for infrastructure protection. This is a state funded and executed project. Arin provided the location of the project to be adjacent to the US Route 3 and the Winnepesaukee (Winni) River in Tilton. Arin described the flow of the Winni River as flowing from Lake Winnisquam into Silver Lake and from there ~ 3.1 miles to the project location. From the site the river further flows ~ 5.8 miles where it enters the Merrimack River in Franklin. It was noted the entire flow of the Winni River is highly regulated through multiple active dams along its entire stretch, with the Lakeport Dam at the outlet to Lake Winnisquam controlling ~45% of the flow of the entire river. The closest dam is the Lochmere hydro dam located ~ 3/4 miles downstream, with 3 additional remnant dams near the project location.

Sam showed the original construction plans for the existing wall structure, dated 1929. Sam further discussed and depicted both the existing and proposed construction footprint, to include the 24.75' DOT ROW from centerline. She described the existing guardrail is 14.5' offset from centerline and the proposed guardrail replacement will be in the same location. The proposed slope repair and guardrail replacement will be in the 1929 construction limit. Photos were shown of the existing conditions of the stone wall along the Winni River, as well as the deteriorated rail post. The proposed project will construct a 2:1 stone slope with a utility/storm water panel. The utility poles will be relocated 6' behind the face of the new guardrail (approximately 530' long) for safety.

Thornton, #2020-M325-1



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Map depicting project 2020-M325-1 in Thornton for rehabilitation of existing 36" culvert.

Map created by: Arin Mills on 3/24/2021

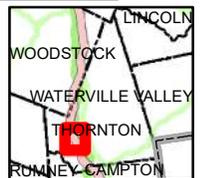
Source: S:\Environment\PROJECTS\THORNTON\2020-M324-04

Legend

- ★ Project Location
- ▨ Watershed
- State Routes



1:12,000



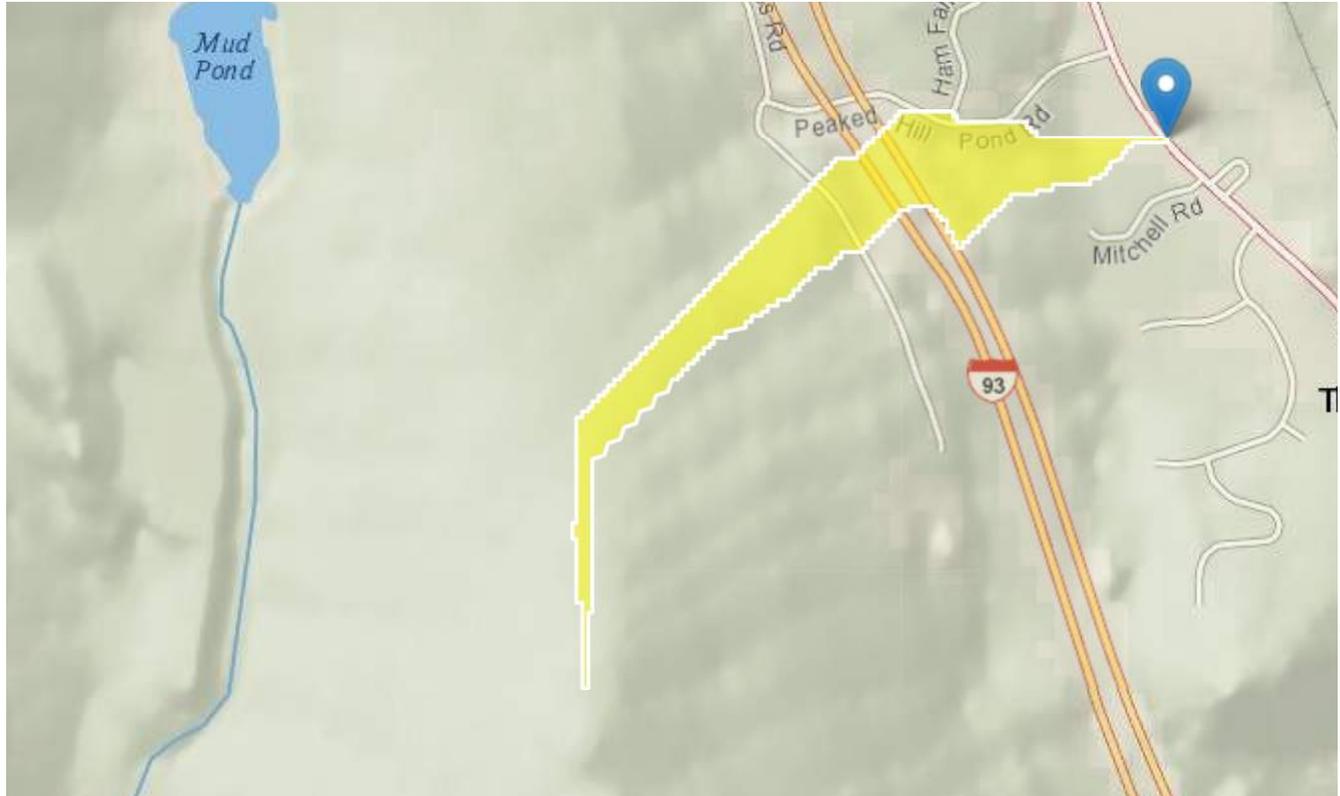
StreamStats Report for Thornton US Route 3 culvert located approximately 350 feet north of Mitchell Road

Region ID: NH

Workspace ID: NH20201201184741666000

Clicked Point (Latitude, Longitude): 43.89664, -71.68004

Time: 2020-12-01 13:47:58 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.05	square miles
APRAVPRE	Mean April Precipitation	3.864	inches
WETLAND	Percentage of Wetlands	0	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	795	feet per mi
TEMP	Mean Annual Temperature	42.849	degrees F
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	18.3	inches
CONIF	Percentage of land surface covered by coniferous forest	5.1768	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	8.19	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	14.531	percent
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	68.2449	percent
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.3	inches
TEMP_06_10	Basinwide average temperature for June to October summer period	59.417	degrees F
ELEVMAX	Maximum basin elevation	1332.85	feet
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	44.7	inches
MINTEMP_W	Mean winter minimum air temperature over basin surface area	10.706	degrees F
SNOFALL	Mean Annual Snowfall	93.661	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	8.78	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	44.8	inches

Peak-Flow Statistics Parameters^[Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.05	square miles	0.7	1290

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
APRAVPRE	Mean April Precipitation	3.864	inches	2.79	6.23
WETLAND	Percent Wetlands	0	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	795	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers^[Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report^[Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
2 Year Peak Flood	4.4	ft ³ /s
5 Year Peak Flood	8.47	ft ³ /s
10 Year Peak Flood	12.3	ft ³ /s
25 Year Peak Flood	17.9	ft ³ /s
50 Year Peak Flood	22.9	ft ³ /s
100 Year Peak Flood	29	ft ³ /s
500 Year Peak Flood	45	ft ³ /s

Peak-Flow Statistics Citations

Olson, S.A., 2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S. Geological Survey Scientific Investigations Report 2008-5206, 57 p. (<http://pubs.usgs.gov/sir/2008/5206/>)

Low-Flow Statistics Parameters^[Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.05	square miles	3.26	689
TEMP	Mean Annual Temperature	42.849	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	18.3	inches	16.5	23.1

Low-Flow Statistics Disclaimers^[Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report^[Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.00119	ft ³ /s
7 Day 10 Year Low Flow	0.000232	ft ³ /s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D., 2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S. Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

Flow-Duration Statistics Parameters^[Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.05	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	18.3	inches	16.5	23.1
TEMP	Mean Annual Temperature	42.849	degrees F	36	48.7

Flow-Duration Statistics Disclaimers^[Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report^[Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	0.0188	ft ³ /s
70 Percent Duration	0.0122	ft ³ /s
80 Percent Duration	0.00601	ft ³ /s
90 Percent Duration	0.00252	ft ³ /s
95 Percent Duration	0.00135	ft ³ /s
98 Percent Duration	0.00069	ft ³ /s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

Seasonal Flow Statistics Parameters_[Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.05	square miles	3.26	689
CONIF	Percent Coniferous Forest	5.1768	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	8.19	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	14.531	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	68.2449	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.3	inches	6.83	11.5
TEMP	Mean Annual Temperature	42.849	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	59.417	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	18.3	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	1332.85	feet	260	6290

Seasonal Flow Statistics Disclaimers_[Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Seasonal Flow Statistics Flow Report_[Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	0.0414	ft ³ /s
Jan to Mar15 70 Percent Flow	0.0341	ft ³ /s
Jan to Mar15 80 Percent Flow	0.0291	ft ³ /s

Statistic	Value	Unit
Jan to Mar15 90 Percent Flow	0.0193	ft ³ /s
Jan to Mar15 95 Percent Flow	0.0147	ft ³ /s
Jan to Mar15 98 Percent Flow	0.0116	ft ³ /s
Jan to Mar15 7 Day 2 Year Low Flow	0.0261	ft ³ /s
Jan to Mar15 7 Day 10 Year Low Flow	0.0125	ft ³ /s
Mar16 to May 60 Percent Flow	0.111	ft ³ /s
Mar16 to May 70 Percent Flow	0.0858	ft ³ /s
Mar16 to May 80 Percent Flow	0.0593	ft ³ /s
Mar16 to May 90 Percent Flow	0.0401	ft ³ /s
Mar16 to May 95 Percent Flow	0.0282	ft ³ /s
Mar16 to May 98 Percent Flow	0.0184	ft ³ /s
Mar16 to May 7 Day 2 Year Low Flow	0.0337	ft ³ /s
Mar16 to May 7 Day 10 Year Low Flow	0.017	ft ³ /s
Jun to Oct 60 Percent Flow	0.00526	ft ³ /s
Jun to Oct 70 Percent Flow	0.00367	ft ³ /s
Jun to Oct 80 Percent Flow	0.00198	ft ³ /s
Jun to Oct 90 Percent Flow	0.00112	ft ³ /s
Jun to Oct 95 Percent Flow	0.00065	ft ³ /s
Jun to Oct 98 Percent Flow	0.000615	ft ³ /s
Jun to Oct 7 Day 2 Year Low Flow	0.00132	ft ³ /s
Jun to Oct 7 Day 10 Year Low Flow	0.000266	ft ³ /s
Nov to Dec 60 Percent Flow	0.0626	ft ³ /s
Nov to Dec 70 Percent Flow	0.0492	ft ³ /s
Nov to Dec 80 Percent Flow	0.0399	ft ³ /s
Nov to Dec 90 Percent Flow	0.0263	ft ³ /s
Nov to Dec 95 Percent Flow	0.016	ft ³ /s
Nov to Dec 98 Percent Flow	0.00887	ft ³ /s
Oct to Nov 7 Day 2 Year Low Flow	0.0346	ft ³ /s
Oct to Nov 7 Day 10 Year Low Flow	0.0149	ft ³ /s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (<http://pubs.water.usgs.gov/wrir02-4298>)

Recharge Statistics Parameters[Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	44.7	inches	35.83	53.11
TEMP	Mean Annual Temperature	42.849	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	10.706	degrees F	0.8	19.88
CONIF	Percent Coniferous Forest	5.1768	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	9.3	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	93.661	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	18.3	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	68.2449	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	8.78	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	44.8	inches	37.44	75.91

Recharge Statistics Disclaimers[Groundwater Recharge Statewide 2004 5019]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Recharge Statistics Flow Report[Groundwater Recharge Statewide 2004 5019]

Statistic	Value	Unit
GW_Recharge_Jan_to_Mar15	5.25	in
GW_Recharge_Mar16_to_May	9.21	in
GW_Recharge_Jun_to_Oct	1.99	in
GW_Recharge_Nov_to_Dec	4.52	in

Statistic	Value	Unit
GW_Recharge_Ann	23.5	in

Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (<http://pubs.usgs.gov/sir/2004/5019/http://pubs.usgs.gov/sir/2004/5019/>)

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.4.0

Stream Crossing Summary

Included is a completed NHDOT Stream Crossing Assessment Worksheet. Data that addresses Env-Wt 903.04(j) was collected on 5/12/2021. Please reference the data sheets for the information. At the crossing the stream keyed out to be a Rosgen Stream Type "B"; within the intermittent stream's reach NHDOT determined the stream to be a Rosgen Stream Type "G".

The reference reach was identified by an area of the intermittent stream that was upstream of the area of influence by the crossing and in an area where influence by the surrounding development was minimized.

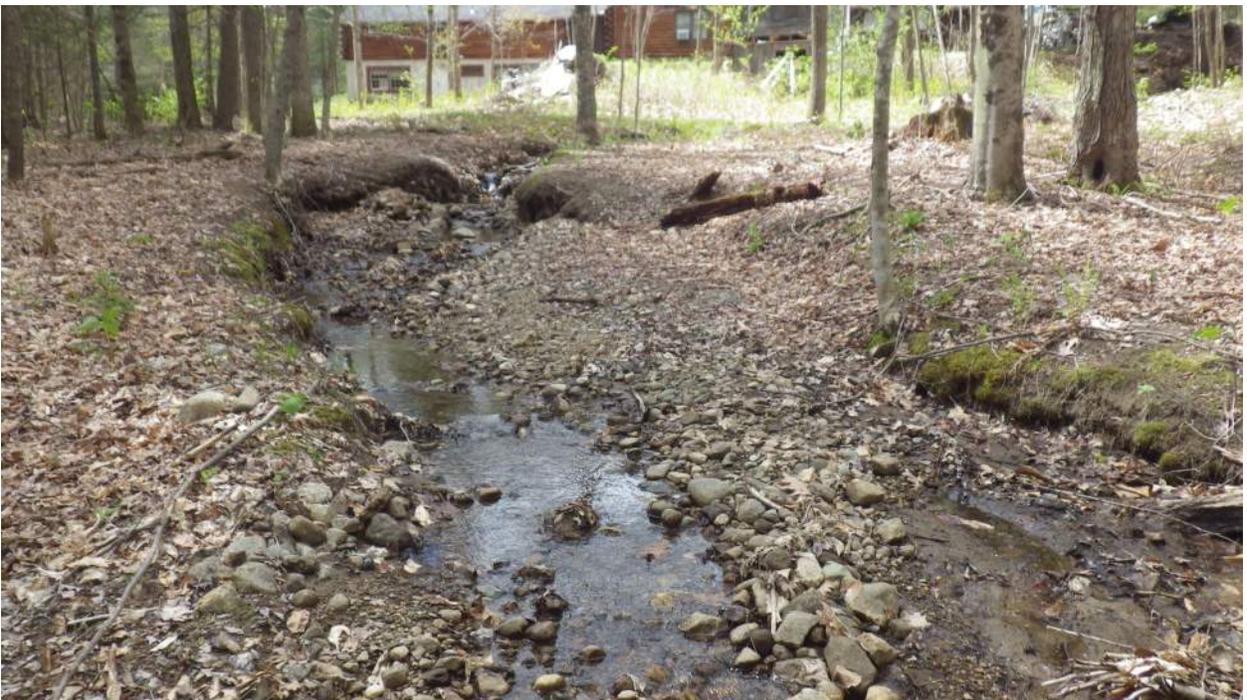
Based on the un named intermittent stream's streamstats watershed size (33 acres) the stream crossing is classified as a Tier 1 crossing. Based on the reference reach's Rosgen Stream Type the entrenchment ratio multiplier is 1-1.4. Therefore, the range of compliant sized crossings are 6.3' to 8.8' wide in diameter.



Reference Reach 1 Looking Upstream along the Intermittent Stream's Watercourse



Reference Reach 2 Looking Upstream along the Intermittent Stream's Watercourse



Reference Reach 3 Looking Upstream along the Intermittent Stream's Watercourse

Env-Wt 903.04(j) The following channel information at the crossing and for the reference reach:

(1) The classification of the stream using the Rosgen classification system as described in Applied River Morphology by Dave Rosgen, 1996, available as noted in Appendix B, at the crossing and upstream and downstream of the crossing;

(2) Bankfull width;

(3) Bankfull depth;

(4) Entrenchment ratio;

(5) Sinuosity; and

(6) Flood-prone width

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020 m325-1

Location of Crossing US Rt 3

Date of field assessment 5/12/21

Thornton 2020 m325-1

Stream Parameters at Crossing

Existing Crossing (type and size): 36" concrete pipe

Watershed size 33 acres

CMP RCP HDPE Arch/Squash Pipe Closed Box Open Box Bridge Other _____

General Information to be collected at the Crossing:

GPS Wetland Delineation: YES NO

Riparian Zone (surrounding or on the banks): immediately @ rd

Extent of vegetation (circle): absent, low density, moderate density, high density

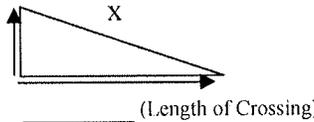
Type of dominant vegetation (circle): graminoid, herbaceous, shrub/sapling, tree

Dominant Species:	
Red maple	willow
Ash (green)	trillium
choked cherry	Canada may flower
Speckled alder	sensitive fern
viburnum	dewberry
Meadowsweet (alba)	

Jack and the pulpit

* information collected by Engineer

Slope at crossing: 6.7% (Rise in Elev.)



Outlet Data:

Depth of water at invert if not perched: _____ (example):

Perched at outlet? YES NO (If yes, Distance from invert to the waters surface: 0.5') (example):

Tailwater Controls present at crossing? YES NO

Pool Configuration: width 20' length: 28.3' Max pool depth at outlet: 1.8'

Location (distance from outlet): _____ Materials: sand immediately at outlet

Dominant Channel Material (visual assessment): sand silt gravel cobble boulder bedrock

Pebble Count: YES NO (Collect Data on Pg. 2)

- Photo of Outlet Structure
- Photo of Downstream Conditions
- Outlet Cross Section (Use Pg. 3 to collect Data)

Intermittent R4SB sand at crossing
↓
Doesn't show up on NH flow or USGS
cobble/gravel

Inlet Data:

Depth of water at inlet: _____ (example):

1 ft before enters inlet of culvert

Dominant Channel Material (visual assessment): sand silt gravel cobble boulder bedrock

Pebble Count: YES NO (Collect Data on Pg. 2)

occasional boulder, bobble, gravel

- Photo of Inlet Structure
- Photo of Upstream Conditions
- Inlet Cross Section (Use Pg. 4 to collect Data)

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thomton 2020-M325-1 Location of Crossing us Rt 3

Date of field assessment 5/12/21

At Crossing Pebble Counts: - measure at least 100 "pebbles" along a channel cross-section when possible (counts are usually done in riffles); measure the first "pebble" you touch at the end of your foot as you work your way across the channel; substrate is measured along the intermediate axis (neither the longest nor the shortest of the three perpendicular axes)

(Check Box Tally)

Substrate Material	Upstream from crossing	Downstream from crossing	Within Structure
Sand (<0.007')	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Gravel (0.007'-0.21')	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Cobble (0.22' - 0.83')	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Boulder (0.92' - 13.3')	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Bedrock (>13.3')	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

* Not required for a tier 1 Stream crossing

Visual assessment
100% sand other than stacked boulders and cobbles at inlet

None up in the structure

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020-M325-1 Location of Crossing US Rt 3

Date of field assessment 5/12/21

Outlet Cross Section:

Starting bank (left/right)

Dist. from bank (ft.)	Dbf
1	1.7
2	1.7
3	1.5
4	1.2
5	
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Avg Dbf = 1.5'
 Max water depth = 0.5' $\frac{1.7}{2} = 0.85$
 Ctr of structure @: N/A
 taken down stream w/in channelized stream reach
 Wbf = 4.4
 Flood Prone Width = 6ft entrenched

Abutter comments

July/Aug pool gets dry
 Dry in summer!

58ft @ 3.4ft BFD
 Developed landscape 3 of 4 likely was where stream flowed previously

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020-M325-1 Location of Crossing US Rt 3

Date of field assessment 5/12/21

Inlet Cross Section:

Starting bank (left/right)

Dist. from bank (ft.)	Dbf
1	0.4
2	0.7
3	0.6
4	0.6
5	0.7
6	0.8
7	0.3
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Avg Dbf = 0.6'

Max water depth = 0.3'

Ctr of structure @: 2ft

Wbf = 7.5'

Flood Prone Width = 43ft

River left intact floodplain
right bank, and

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020-4325-1

Location of Crossing US Rt 3

Date of field assessment 5/12/21

Reference Reach 1:

Starting bank (left/right)

Dist. from bank (ft.)	Dbf
1	0.6
2	0.8
3	0.8
4	0.7
5	0.5
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Avg Dbf = 0.7'

Max water depth = 0.3'

Ctr of structure @: N/A

Wbf = 5.7'

Flood Prone Width = 38.3'

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020-M325-1

Location of Crossing US Rt 3

Date of field assessment 5/12/21

Reference Reach 2:

Starting bank (left/right)

Dist. from bank (ft.)	Dbf
1	0.9
2	1.1
3	1.4
4	1.2
5	0.6
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Avg Dbf= 1.0'
 Max water depth= 0.7'
 Ctr of structure@: N/A
 Wbf= 5.8'
 Flood Prone Width= 40'

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020 - W325-1

Location of Crossing US Rt 3

Date of field assessment 5/12/21

Reference Reach 3:

Starting bank (left/right)

Dist. from bank (ft.)	Dbf
1	0.2
2	0.3
3	0.4
4	0.4
5	0.5
6	0.5
7	0.5
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Avg Dbf= 0.3'
 Max water depth= 0.3'
 Ctr of structure@: N/A
 Wbf= 7.5'
 Flood Prone Width= 11.2

end of meander
 widen & flatten
 area

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project _____ Location of Crossing _____ Date of field assessment _____

Longitudinal Profile for Reference Reach (length = 7-10 times bankfull width)

* Not required for Tier 1 crossing

Starting at Reference 1 going towards Reference 2:

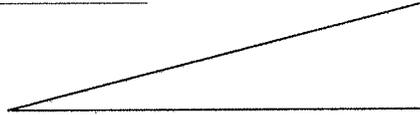
Shooting a pop level from at a height of: _____ ft.

Reading on survey rod at Ref 2: _____ ft.

A Difference of: _____ ft.

Distance between Ref 1 and Ref 2: _____ ft.

Slope at crossing: _____



Depth of Water at Thalweg: _____

(Features: *Riffle, Run, Pool, Step, Glide*)

Features between Ref 1 and 2: _____ @ _____ ft
 _____ @ _____ ft

From Reference 2 going towards Reference 3:

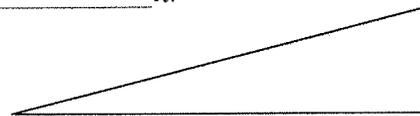
Shooting a pop level from at a height of: _____ ft.

Reading on survey rod at Ref 2: _____ ft.

A Difference of: _____ ft.

Distance between Ref 1 and Ref 2: _____ ft.

Slope at crossing: _____



Depth of Water at Thalweg: _____

(Features: *Riffle, Run, Pool, Step, Glide*)

Features between Ref 1 and 2: _____ @ _____ ft
 _____ @ _____ ft

NHDOT STREAM CROSSING ASSESSMENT WORKSHEET

Project Thornton 2020-M325-1

Location of Crossing US Rt 3

Date of field assessment 5/12/21

5.7

Office Calculations for (At Crossing Data):

used inlet data only b/c outlet highly influenced

Entrenchment Ratio: $W_{fpa}/W_{bf} = 43/7.5 = 5.7 \rightarrow$ slightly entrenched

Width/Depth Ratio: $W_{bf}/\text{Average Depth} = 7.5/0.6 = 12.5 \rightarrow$ moderate w/d ratio

Sinuosity: stream length/valley length = Sinuosity man made / influenced at outlet

Channel Slope: (information from engineer)

Channel Material: outlet predominantly sand ; inlet mixture of sand, gravel, cobbles

Rosgen Classification: Rosgen Stream Type "C"

Average $W_{bf} = 0.7 + 1.0 + 0.3 = 0.7'$

Average $W_{fpa} = 5.7 + 5.8 + 7.5 = 6.3'$

Average $f_{pw} = 38.3 + 40 + 11.2 = 29.8'$

Office Calculations for (Reference Reach Data):

Entrenchment Ratio: $W_{fpa}/W_{bf} = 29.8/6.3 = 4.7 \rightarrow$ slightly entrenched

Width/Depth Ratio: $W_{bf}/\text{Average Depth} = 6.3/0.7 = 9 \rightarrow$ low w/d ratio

} leads to Type "E" however that doesn't make sense for this system

Sinuosity: stream length/valley length = _____

Channel Slope: * not collected , not required for Tier 1 crossing

Channel Material: Sand and gravel

Rosgen Classification: Based on field observations ~~at~~ Rosgen Type "G"

*Photo * Ref Reach 1 looking upstream*

L > entrenchment ratio multiplier = 1.0-1.4

$6.3 \times 1 = 6.3$

$6.3 \times 1.4 = 8.8$

$(6.3 \times 1.2) + 2 = 9.56$

CONFIDENTIAL – NH Dept. of Environmental Services review
NH Natural Heritage Bureau
NHB Datacheck Results Letter

Memo

To: Arin Mills, NH Department of Transportation
John O. Morton Building
7 Hazen Drive
Concord, NH 03302-0483

From: Amy Lamb, NH Natural Heritage Bureau
Date: 3/16/2021 (valid until 03/16/2022)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Wetland Standard Dredge & Fill - Major, USA CE - General Permit

NHB ID: NHB21-0813 Town: Thornton Location: un-named stream under US 3
Description: Work will rehabilitate the existing 36" RCP which carries an un-named stream under US 3. The proposed design is still under development, and possible slip lining is being considered to address deficiencies in the existing pipe.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments NHB: No Comments At This Time
F&G: Please contact Kim Tuttle.

Invertebrate Species	State¹	Federal	Notes
Cobblestone Tiger Beetle (<i>Cicindela marginipennis</i>)	E	--	Contact the NH Fish & Game Dept (see below).

Vertebrate species	State¹	Federal	Notes
Wood Turtle (<i>Glyptemys insculpta</i>)	SC	--	Contact the NH Fish & Game Dept (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

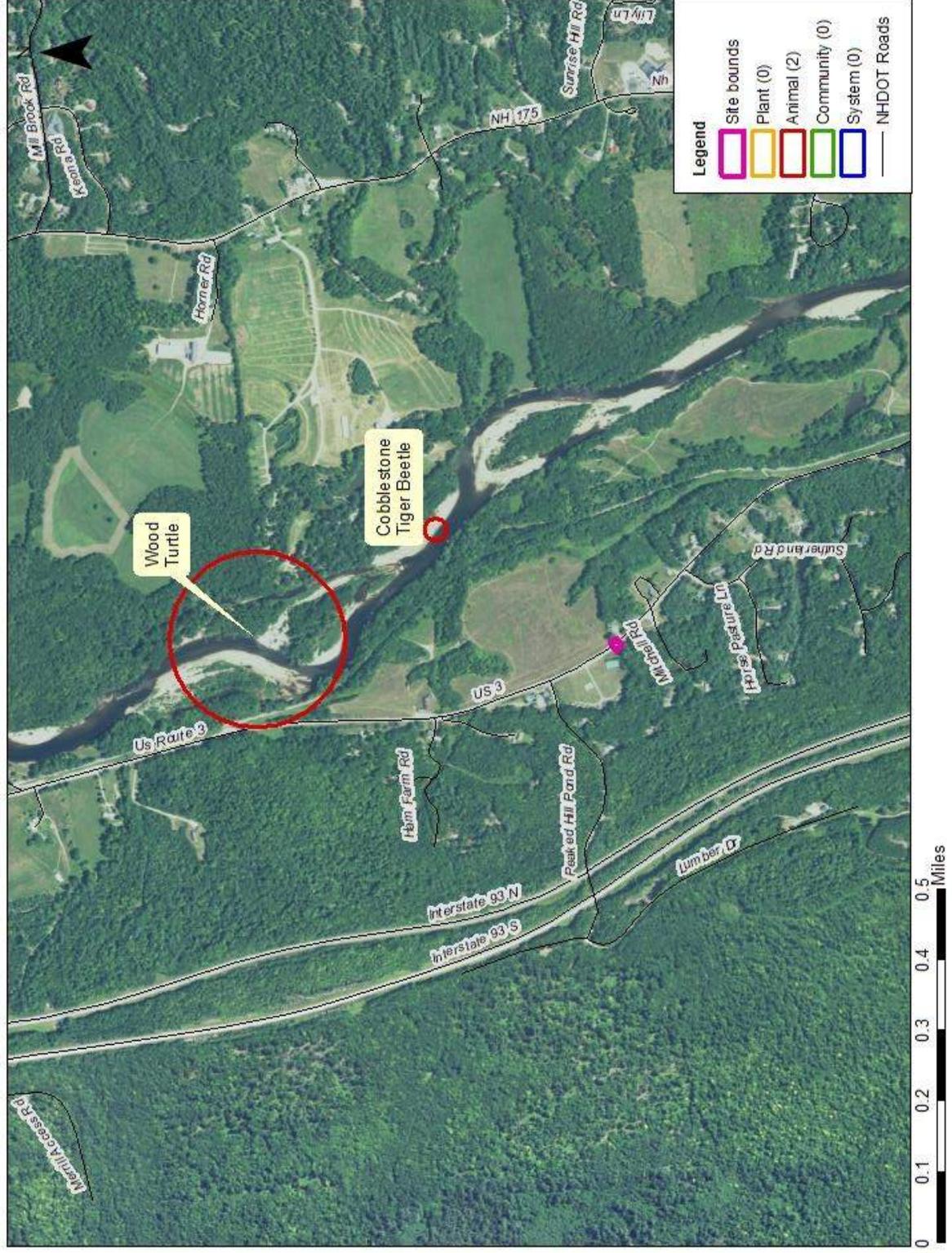
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB21-0813



Mills, Arin

From: Henderson, Carol
Sent: Friday, June 25, 2021 11:18 AM
To: Mills, Arin
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Great. Sounds like an adequate solution. Thank you, Carol

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Friday, June 25, 2021 10:59 AM
To: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Yes Carol, I should have clarified that. We were thinking a stepping stone type design to improve turtle passage.

Thanks!

Arin

From: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Sent: Friday, June 25, 2021 10:49 AM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Hi Arin:

Thank you for the updated information. I agree. The only other change would be more than one layer of flat rock at the outlet, something like tiering to provide multiple levels to access the stones, i.e. for turtles to access. Do you see what I am thinking? It would be a significant amount of work to do this either. Please let me know your thoughts. Thanks for reaching out. Carol

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Friday, June 25, 2021 10:40 AM
To: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Carol,

I wanted to reach back out to provide information/discussion from the Nat Res Agency meeting last week (6/16) as it pertains to the wildlife. The engineer is able to install a corrugated slipline to improve the ability for turtle passage. She did run the hydraulic calculations for this material and determine it would not have a significant impact on either the velocities or inlet control depths, and this information was provided at the meeting.

As for the backwatering to increase aquatic organism passage we don't feel this site it appropriate due to the both the steep grade of the pipe and the intermittent stream. The Department does not feel effective backwatering could be accomplished during the primary time (summer/fall) this would benefit many of the species it would be aiming to benefit. Karl asked Pete S to provide his thoughts and he recommended the installation of some flat stones at the outlet to match the invert elevation could improve wildlife passage in a low impact manner. Karl agreed this would be a

suitable solution, and our District engineer further agreed this is a feasible option to incorporate into the design. Do you agree?

Feel free to reach out with any additional concerns/questions you may have as I am hoping this concludes my F&G review for the project.

Arin Mills
Senior Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov

From: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Sent: Friday, June 11, 2021 3:12 PM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Hi Arin:

Although slip lining is not our preferred option for repair of culverts, the Department understands that the proposal is cost effective, will not be changing the velocity of the stream significantly (based on the hydrology information provided) and understand the difficulties of the culvert replacement based upon the significant amount of fill above the culvert. Since the NHB identified the Wood turtle, please consider roughing the bottom of the slip liner in order to improve the texture for turtles to grip too. This has been suggested in the past. If the slip lining maintains the corrugation of the pipe, that would also be sufficient. The culvert pictures did show that the culvert was perched. I would recommend that the perch be eliminated by backwatering the area to increase aquatic organism connectivity. I hope this answers all of your questions. Conducting the work within the summer or early Fall months would be preferable. If you need further clarification, please do not hesitate to contact me; however, I will be on leave all next week. Thank you, Carol

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Monday, June 7, 2021 1:01 PM
To: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Carol, Attached are the velocity calculations done by the engineer. It does not appear the velocities will change significantly. She explained to me that the Rational method (versus StreamStats) is recommended for this small watershed size (~33 acres).

Let me know if there are any other questions/information I can provide.

~ Arin

From: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Sent: Monday, June 7, 2021 10:01 AM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Subject: RE: Thornton 2020-M325-1 Wildlife Review

Hi Arin:

I will not be attending the next June Natural Resource meeting, but I will have my comments for the projects prior to the meeting date. Was a hydrological review completed for the sliplining proposal, ie., will the velocity increase significantly? I know that the increase in velocity has been reported in the past for other slipline projects and it is often very little of an increase. Please let me know. Thanks, Carol

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Monday, June 7, 2021 9:32 AM
To: Henderson, Carol <Carol.B.Henderson@wildlife.nh.gov>
Subject: Thornton 2020-M325-1 Wildlife Review

Hello Carol,

I just wanted to reach out on this project as it is planned to be presented at the June 16th Nat Res meeting. Attached is Kim T response in regards to the NHB review. The stream was determined to be intermittent based on the field review during the wetland delineation done May 12, 2021. It was not simply on evidence from the adjacent landowner. The proposed project will be presented as slip line under Env-Wt 904.08 as a cost effective means to repair this pipe which is deep below the roadway bed. Let me know if there is additional information I can provide ahead of the meeting.

Arin Mills
Senior Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov

Mills, Arin

From: Tuttle, Kim
Sent: Thursday, June 3, 2021 9:37 AM
To: Mills, Arin
Cc: Doperalski, Melissa; Megyesy, Joshua
Subject: RE: Wildlife Review Thornton NHB21-0813

Hello Arin,

It looks like brook trout habitat to John Magee and is probably perennial. Is the neighbor who insists it is intermittent the same one who has dammed it to create 'Stilling Pool'? It may not provide hibernation habitat but it certainly provides wood turtle habitat as wood turtles are highly terrestrial and spend much of the warmer months within ¼ mile of the major stream or river they are associated with. We cannot recommend slip lining a 36" with a smooth bore plastic in this trib close to the Pemi as the increased water velocities and slippery interior will reduce upstream passage opportunities for turtles and amphibians as well as "weak" swimming fish such as sculpin and dace. If the slip lining proceeds, the culvert should not be perched and should be backwatered at all times except in very dry conditions.

We do not expect impacts to cobblestone tiger beetle.

Thanks,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Thursday, June 3, 2021 9:23 AM
To: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: RE: Wildlife Review Thornton NHB21-0813

Hey Kim. Just wondering if you have had time to review this project? We are hoping to present this project at the upcoming June 16th Natural Resource Meeting and I generally would provide any comments to the group. Feel free to reach out if there are any questions I may be able to help answer.

~ Arin

From: Mills, Arin
Sent: Monday, May 17, 2021 11:41 AM
To: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: Wildlife Review Thornton NHB21-0813

Hello Kim,

I wanted to follow-up on a project review for the above referenced NHB review received for a culvert repair project in Thornton. The project a proposed slip line to an existing 36" RCP which carries an un-named stream under US Route 3. It has been determined slip line is the best feasible repair to the deteriorating concrete pipe at this time due to the depth of the pipe below the existing road surface, and maintain the safety for the traveling public in an economically practical manner. At this time, it is not anticipated any ground disturbance or impacts to the surrounding stone walls will be required to install this slip line.

The NHB review determined Cobblestone tiger beetle and Wood turtle are known to occur near the project, and associated with the Pemigewasset (Pemi) River downstream of the project. I conducted a site visit to the project on May 12th, 2021. Based on my field review I do not anticipate Cobblestone tiger beetle using this un-named stream and are likely associated with the sand conditions along the Pemi river.

I also conducted a desktop and field review for potential Wood turtle use of this crossing, and used knowledge from my previous work with the species. Wood turtles are likely using the Pemi River for winter hibernation, as this un-named tributary to the Pemi would not offer the depth or riverine conditions suitable to winter hibernation. The species is also likely utilizing the sand banks and shrubby floodplains surrounding the Pemi during the summer months. During my field visit I did not determine suitable habitat either onsite or upstream of the crossing for the species. The crossing has very steep banks, with limited sandy/cleared areas suitable for turtle nesting. Upstream of the crossing is a mature forest, with residential development interspersed with no known sand/gravel area suitable for turtle nesting. In further looking at both the aerial imagery and F&G habitat Land cover the upstream habitat of this Tier 1 stream is 'Northern Hardwood Conifer Forest' (See attached map), also not suitable for turtle nesting. I would assume the Wood turtle is utilizing the sandy banks and floodplain adjacent to the Pemi River for both summer foraging and nesting, and likely not utilizing this crossing throughout its home range. We further concluded this un-named stream is intermittent based on field conditions and conversation with adjacent landowner, which further would likely not support Wood turtle.

I have included a photo sheet with some photos taken during my field visit. I do have additional photos if there is something of particular interest you may have. Would you concur there are no anticipated impacts from this project on either species due to lack of suitable habitat? If not, let me know what further concerns or questions you may have and I would be happy to discuss further.

Thanks, and have a great day!

Arin Mills
Senior Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

April 05, 2021

Consultation Code: 05E1NE00-2021-SLI-2188

Event Code: 05E1NE00-2021-E-06874

Project Name: Thornton Culvert Rehab, 2020-M325-1

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:

<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>;

<http://www.towerkill.com>; and

<http://>

www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2021-SLI-2188

Event Code: 05E1NE00-2021-E-06874

Project Name: Thornton Culvert Rehab, 2020-M325-1

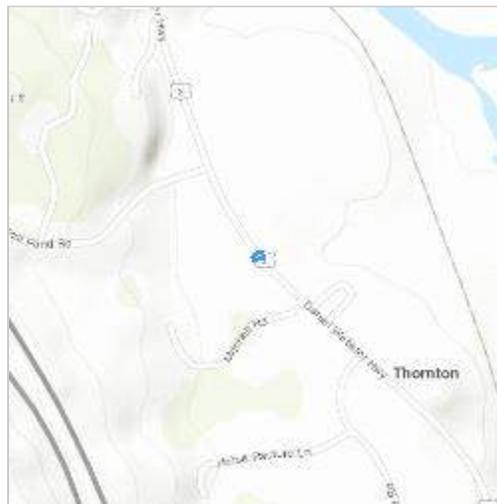
Project Type: TRANSPORTATION

Project Description: Work will include rehabilitation of an existing 36" RCP which carries US Route 3 over and un-named stream.

Project Location:

Approximate location of the project can be viewed in Google Maps: [https://](https://www.google.com/maps/@43.89676535,-71.68022564876725,14z)

www.google.com/maps/@43.89676535,-71.68022564876725,14z



Counties: Grafton County, New Hampshire

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



United States Department of the Interior



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<http://www.fws.gov/newengland>

IPaC Record Locator: 144-100857515

April 05, 2021

Subject: Consistency letter for the 'Thornton Culvert Rehab, 2020-M325-1' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Arin Mills:

The U.S. Fish and Wildlife Service (Service) received on April 05, 2021 your effects determination for the 'Thornton Culvert Rehab, 2020-M325-1' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause “take”^[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action’s effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Thornton Culvert Rehab, 2020-M325-1

2. Description

The following description was provided for the project 'Thornton Culvert Rehab, 2020-M325-1':

Work will include rehabilitation of an existing 36" RCP which carries US Route 3 over and un-named stream.

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.89676535,-71.68022564876725,14z>



Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

No

2. Will your activity purposefully **Take** northern long-eared bats?

No

3. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

Automatically answered

No

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

Yes

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

No

6. Will the action involve Tree Removal?

Yes

7. Will the action only remove hazardous trees for the protection of human life or property?

No

8. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

No

9. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

.1

2. If known, estimated acres of forest conversion from April 1 to October 31

.1

3. If known, estimated acres of forest conversion from June 1 to July 31

.1

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

Date Reviewed: 5/18/2021
(Desktop or Field Review Date)

This Project uses only State funding; however project activities listed below comply with the PA.

Project Name: Thornton Culvert Rehab

State Number: 2020-M325-1 **FHWA Number:** N/A

Environmental Contact: Arin Mills **DOT**
Email Address: Arin.j.mills@dot.nh.gov **Project Manager:** Samantha Fifield

Project Description: Rehabilitation of 36" RCP which carries US 3 over an un-named stream in Thornton. Rehabilitation will include use of slip-lining of existing culvert.

Please select the applicable activity/activities:

Highway and Roadway Improvements	
<input type="checkbox"/>	1. Modernization and general highway maintenance that may require additional highway right-of-way or easement , including: Choose an item. Choose an item.
<input type="checkbox"/>	2. Installation of rumble strips or rumble stripes
<input type="checkbox"/>	3. Installation or replacement of pole-mounted signs
<input type="checkbox"/>	4. Guardrail replacement, provided any extension does not connect to a bridge older than 50 years old (unless it does already), and there is no change in access associated with the extension
Bridge and Culvert Improvements	
<input type="checkbox"/>	5. Culvert replacement (excluding stone box culverts), when the culvert is less than 60" in diameter and excavation for replacement is limited to previously disturbed areas
<input type="checkbox"/>	6. Bridge deck preservation and replacement, as long as no character defining features are impacted
<input checked="" type="checkbox"/>	7. Non-historic bridge and culvert maintenance, renovation, or total replacement, that may require minor additional right-of-way or easement , including: a. replacement or maintenance of non-historic bridges Choose an item.
<input type="checkbox"/>	8. Historic bridge maintenance activities within the limits of existing right-of-way, including: Choose an item. Choose an item.
<input type="checkbox"/>	9. Stream and/or slope stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions)
Bicycle and Pedestrian Improvements	
<input type="checkbox"/>	10. Construction of pedestrian walkways, sidewalks, sidewalk tip-downs, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons
<input type="checkbox"/>	11. Installation of bicycle racks
<input type="checkbox"/>	12. Recreational trail construction
<input type="checkbox"/>	13. Recreational trail maintenance when done on existing alignment
<input type="checkbox"/>	14. Construction of bicycle lanes and shared use paths and facilities within the existing right-of-way
Railroad Improvements	
<input type="checkbox"/>	15. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, provided no historic railroad features are impacted , including, but not limited to: Choose an item.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

	Choose an item.
<input type="checkbox"/>	16. In-kind replacement of modern railroad features (i.e. those features that are less than 50 years old)
<input type="checkbox"/>	17. Modernization/modification of railroad/roadway crossings provided that all work is undertaken within the limits of the roadway structure (edge of roadway fill to edge of roadway fill) and no associated character defining features are impacted
Other Improvements	
<input type="checkbox"/>	18. Installation of Intelligent Transportation Systems
<input type="checkbox"/>	19. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements where no construction will occur
<input type="checkbox"/>	20. Rehabilitation or replacement of existing storm drains.
<input type="checkbox"/>	21. Maintenance of stormwater treatment features and related infrastructure

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.

Work will include repair through use of slip lining to the existing pipe. No ground disturbing activities will occur to rehabilitate the structure.

Please submit this Certification Form along with the Transportation RPR, including photographs, USGS maps, design plans and as-built plans, if available, for review. Note: The RPR can be waived for in-house projects, please consult Cultural Resources Program Staff.

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	No	NHDHR R&C # assigned?	Click here to enter text.
Please identify public outreach effort contacts; method of outreach and date:	<u>Letters with sent on April 9, 2021 to the Town of Thornton, including the Conservation Commission, Planning Department, Road and Fire and Police Department. The Chair of the Board of Selectmen Roy Saborn responded, only noting the" Blake Mtn Cemetery is adjacent to subject locus." In addition, DOT has spoken with the landowner.</u>		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

<input checked="" type="checkbox"/>	No Potential to Cause Effects	<input type="checkbox"/>	No Historic Properties Affected
This finding serves as the Section 106 Memorandum of Effect. No further coordination is necessary.			
<input type="checkbox"/>	This project does <i>not</i> comply with Appendix B. Review will continue under Stipulation VII of the Programmatic Agreement. Please contact NHDOT Cultural Resources Staff to determine next steps.		
NHDOT comments:			
 _____ NHDOT Cultural Resources Staff		5/18/2021 _____ Date	

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

Project sponsors should not predetermine a Section 106 finding under the assumption a project is limited to the activities listed in Appendix B until this form is signed by the NHDOT Bureau of Environment Cultural Resources Program staff.

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the New Hampshire State Historic Preservation Office, the Army Corps of Engineers, New England District, the Advisory Council on Historic Preservation, and the New Hampshire Department of Transportation Regarding the Federal Aid Highway Program in New Hampshire*. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

NHDOT and the State Historic Preservation Office may use provisions of the Programmatic Agreement to address the applicable requirements of NH RSA 227-C:9 in the location, identification, evaluation and management of historic resources, for projects funded by State funds.

If any portion of the project is not entirely limited to any one or a combination of the activities specified in Appendix B (with, or without the inclusion of any activities listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

This No Potential to Cause Effect or No Historic Properties Affected project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.

Project Thornton 2020-M325-1 (1832H District 3)
NHDOT Cultural Resources Review

For the purpose of compliance with regulations of the National Historic Preservation Act, the Advisory Council on Historic Preservation's *Procedures for the Protection of Historic Properties* (36 CFR 800), the US Army Corps of Engineers' *Appendix C*, and/or state regulation RSA 227-C:9, *Directive for Cooperation in the Protection of Historic Resources*, the NHDOT Cultural Resources Program has reviewed the proposed project for potential impacts to historic and archaeological properties.

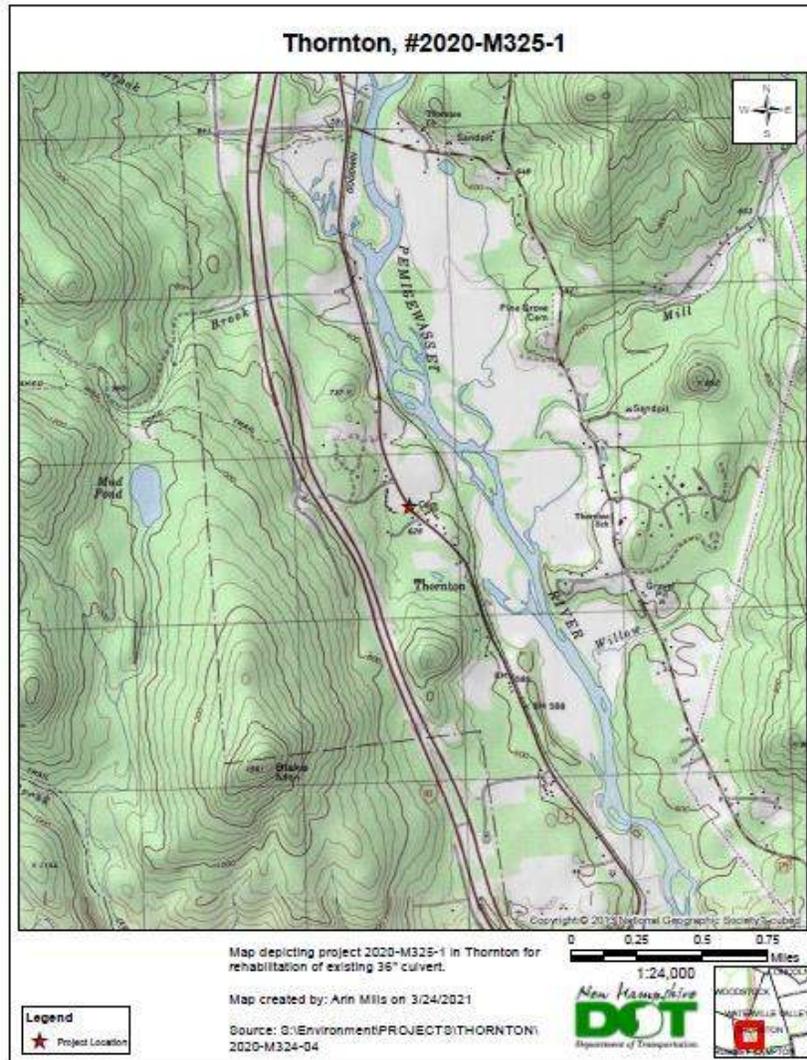
Proposed Project: D3 project to rehabilitate an existing deteriorated 36" RCP which carries US Rt 3 over an un-named stream in Thornton, approximately 350' north of Mitchell Road. At this time the project is being evaluated for slip-line, but coordination with the wetlands program for permitting is underway. The pipe is deeply embedded below Route 3.

District 3 Samantha Fifield could not locate any plans for the crossing, nor does she know the date of the existing pipe installation. Additional project information can be found in: <S:\Environment\PROJECTS\THORNTON\2020-M325-1>
The D3 Global project folder has photos of the site dating to 11/30/2020, and to 5/12/2021 (taken by Arin Mills):
[S:\Global\B58-District3\Environmental Permits\Thornton - US Route 3 36 inch culvert slipline \(2020-M325-1\)](S:\Global\B58-District3\Environmental Permits\Thornton - US Route 3 36 inch culvert slipline (2020-M325-1))

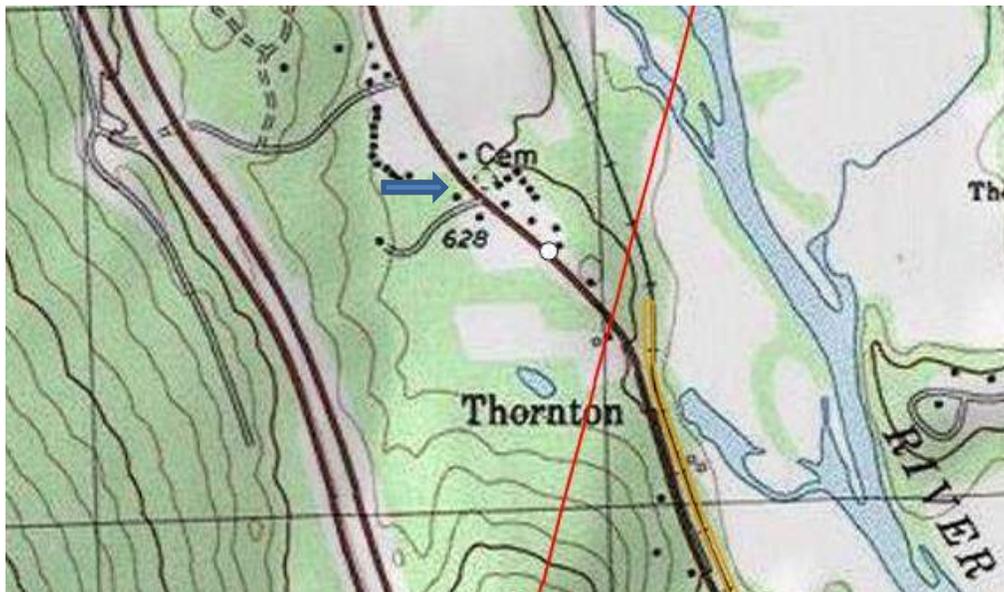
Cartographic review was undertaken by NHDOT BOE Environmental Manager Arin Mills and NHDOT BOE Cultural Resources Specialist/Archaeologist Sheila Charles. The Blake Mountain Cemetery is southeast of the outlet of the culvert, and no excavation is anticipated within 50' of the cemetery.

Arin Mills also summarized the following project details after her site visit in May 2021 and discussions with the District (Sam Fifield):

- There are no planned ground disturbing activities as part of the project. No digging within 50' of the adjacent Blake Mountain Cemetery in the SE quadrant.
- No planned disturbance or impacts to the existing stone wall adjacent to the outlet of the pipe as this is a slip line only. We did speak with the landowner who does like the stone wall, but did recognize it was in disrepair and was in need of repair to maintain integrity- which I presume is her responsibility.
- It appears the entire retaining wall both at the pipe outlet and lining the channel downstream is original, we did not see evidence of new work or even recent repair to the structure. The current landowner has owned the home ~ 10 years and has not done any work to the walls.
- There is a small wooden storage shed (woodshed) in the SE quadrant, and south of the stream. The house is in the NE quadrant and north of the stream. No impacts to either structure are anticipated.
- Sam does not have a plan for access at this time, but does not anticipate any ground disturbance or impacts to the stone retaining wall to conduct the work.
- There is also a stone wall in the SW quadrant that runs parallel to the US 3, see photo labeled 'Looking North Toward Inlet2'. I don't anticipate and impacts to that from this project either.



EMMIT was reviewed on 5/3/2021. No individual inventoried structures or historic districts are associated with the project area.



Project Thornton 2020-M325-1 (1832H District 3)

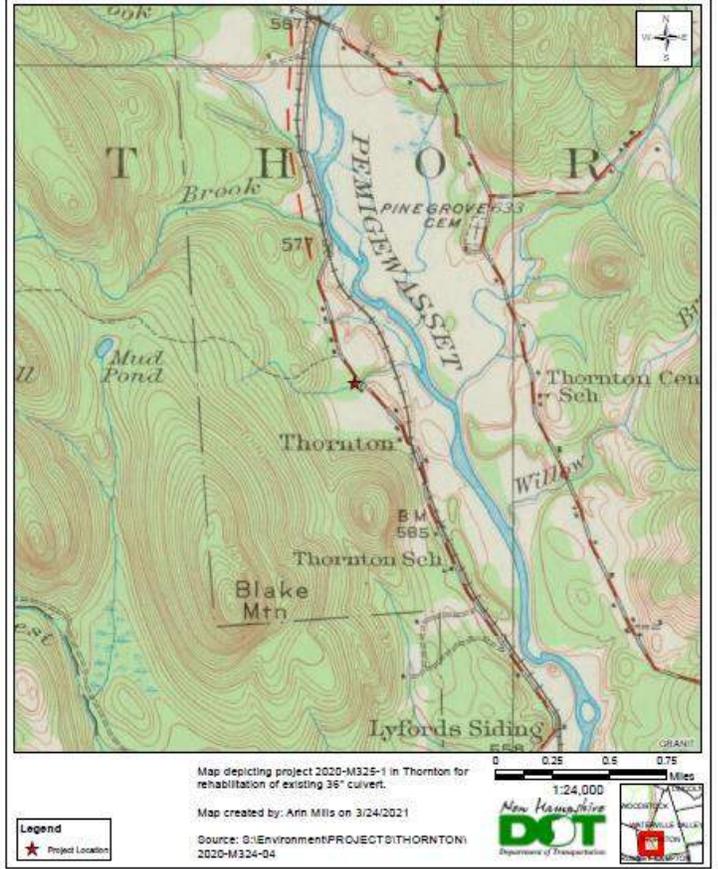
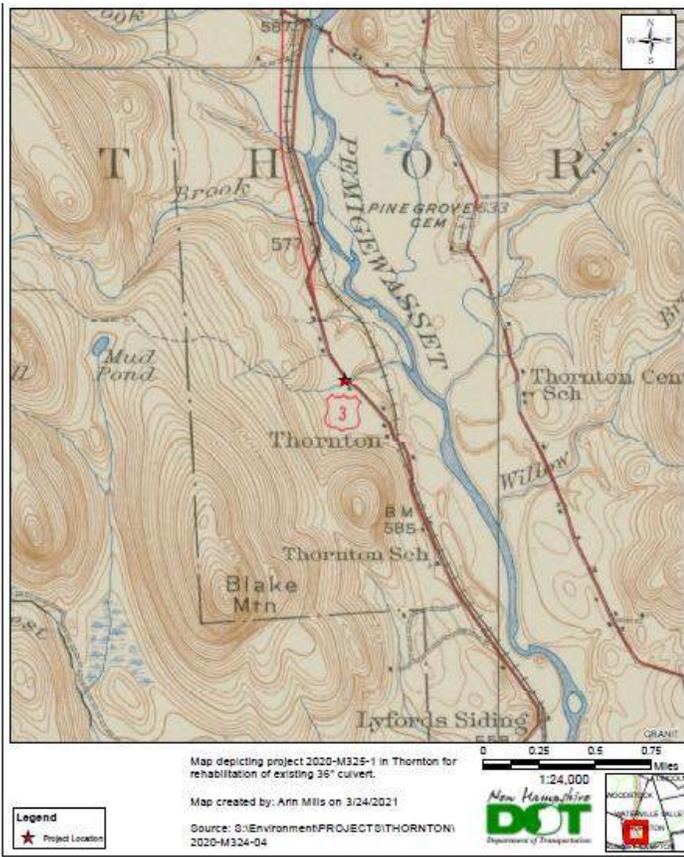
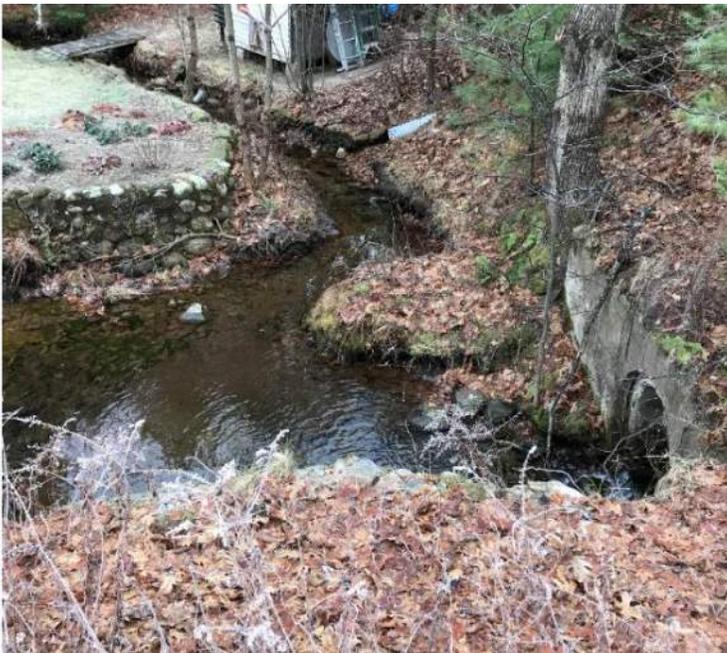


Photo look north on US3, 11/30/2020

Photo of inlet, 11/30/2020



Photos of Outlet, 11/30/2020



Additional Photographs by Arin Mills, 5/12/2021

Thornton, Project #2020-M325-1

May 12, 2021

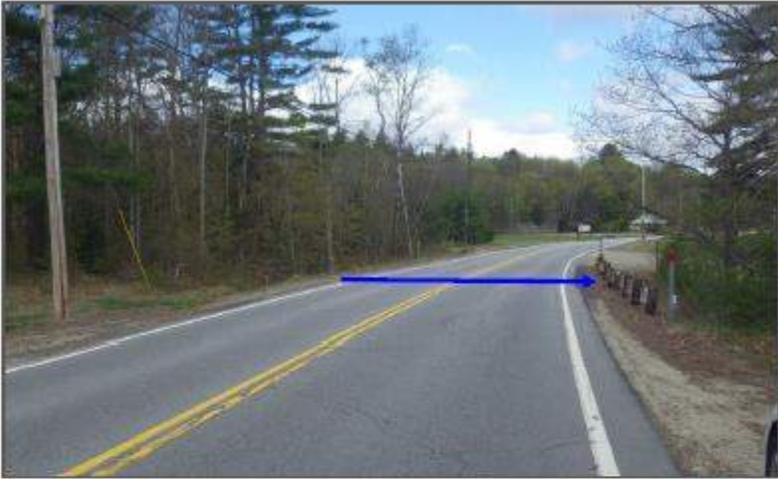


Photo 1: Looking North Down US Route 3



Photo 2: Looking South Down US Route 3

Thornton, Project #2020-M325-1



Photo 7: Looking Downstream from Outlet



Photo 8: Looking Upstream at Outlet

Thornton, Project #2020-M325-1



Photo 9: Looking Downstream Toward 'Stilling Pool' from US 3



Photo 10: Looking Upstream Toward Outlet and 'Stilling Pool'

Above Ground Review

Known/approximate age of structure:

District 3 (Samantha Fifield) could not locate any plans for the crossing, nor does she know the date of the existing pipe installation.

Thornton 2021 tax map and tax assessments revealed neighboring parcels and associated structures:

Tax Map - Parcel #	Location from project area	Address	Construction Date	Structure Type
10-8-7	NE & SE	2886 US RT 3	1945	1.5 story residence, gable roof With 7 X 7" wood shed
10-8-8	NE	No building		
10-9-13	SW	6 Mitchell Road	1969	1 story log home
10-9-19	NW	2901 US RT 3	1955	1 story cabin/cottage; Commercial/ industrial zone use



No Potential to Cause Effect/No Concerns

Concerns

This project qualifies for Section 106 Programmatic Agreement Appendix B under # 7.

<input type="checkbox"/>	7. Non-historic bridge and culvert maintenance, renovation, or total replacement, that may require minor additional right-of-way or easement , including: a. replacement or maintenance of non-historic bridges Choose an item.
--------------------------	--

Below Ground Review

Recorded Archaeological site: Yes No

Nearest Recorded Archaeological Site Name & Number: 27-GR-0251 Willow Brook Cabin

Pre-Contact Post-Contact

Distance from Project Area:
8816 ft southeast of project area

No Potential to Cause Effect/No Concerns

The 1928, 1931 and 1939 USGS topographic quadrangles show one structure off the southwest quadrant of the project area; although the 1892 Hurd map does not depict structures in the project area.

The proposed action is for slip lining the pipe culvert, with no below ground impacts and no excavation within 50 ft of the Blake MT Cemetery in the SE quadrant of the crossing. There is no planned disturbance or impacts to the existing stone wall adjacent to the pipe outlet. . Arin Mills intends to include an Env commitment, which calls for No impacts to the adjacent stone walls, and If ground disturbance or impacts are required, further review by BOE will be required (Arin Mills, 271-3226).

In addition, if easements are needed, further review by the Cultural Resources staff will be needed.

Concerns:

Reviewed by:



5/3/2021; 5/18/2021

NHDOT Cultural Resources Staff

Date:



**US Army Corps
of Engineers**®
New England District

Appendix B

Regional General Permits (GPs) Required Information and Corps Secondary Impacts Checklist

In order for the Corps of Engineers to properly evaluate your application, applicants must submit the following information along with the New Hampshire DES Wetlands Bureau application or permit notification forms. Some projects may require more information. For a more comprehensive checklist, go to www.nae.usace.army.mil/regulatory, “Forms/Publications” and then “Application and Plan Guideline Checklist.” Check with the Corps at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the State of New Hampshire DES Wetlands Bureau application and Permit by Notification forms.

All Projects:

- Corps application form ([ENG Form 4345](#)) as appropriate.
- Photographs of wetland/waterway to be impacted.
- Purpose of the project.
- Legible, reproducible black and white (no color) plans no larger than 11”x17” with bar scale. Provide locus map and plan views of the entire property.
- Typical cross-section views of all wetland and waterway fill areas and wetland replication areas.
- In navigable waters, show mean low water (MLW) and mean high water (MHW) elevations. Show the high tide line (HTL) elevations when fill is involved. In other waters, show ordinary high water (OHW) elevation.
- On each plan, show the following for the project:
- Vertical datum and the NAVD 1988 equivalent with the vertical units as U.S. feet. Don’t use local datum. In coastal waters this may be mean higher high water (MHHW), mean high water (MHW), mean low water (MLW), mean lower low water (MLLW) or other tidal datum with the vertical units as U.S. feet. MLLW and MHHW are preferred. Provide the correction factor detailing how the vertical datum (e.g., MLLW) was derived using the latest National Tidal Datum Epoch for that area, typically 1983-2001.
- Horizontal state plane coordinates in U.S. survey feet based on the Traverse Mercator Grid system for the State of New Hampshire (Zone 2800) NAD 83.
- Show project limits with existing and proposed conditions.
- Limits of any Federal Navigation Project in the vicinity of the project area and horizontal State Plane Coordinates in U.S. survey feet for the limits of the proposed work closest to the Federal Navigation Project;
- Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below the ordinary high water in inland waters and below the high tide line in coastal waters.
- Delineation of all waterways and wetlands on the project site,;
- Use Federal delineation methods and include Corps wetland delineation data sheets. See GC 2 and www.nero.noaa.gov/hcd for eelgrass survey guidance.
- GP 3, Moorings, contains eelgrass survey requirements for the placement of moorings.
- For activities involving discharges of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized, and either a statement describing how impacts to waters of the U.S. are to be compensated for (or a conceptual or detailed mitigation plan) or a statement explaining why compensatory mitigation should not be required for the proposed impacts. Please contact the Corps for guidance.



**US Army Corps
of Engineers**®
New England District

**New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)**

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*		X
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/ . The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?		
2.7 What is the area of the proposed fill in wetlands?		
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?		
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index	X	

3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?		
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		X
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

3.1: NHB21-0813 has determined Wood turtle and Cobblestone tiger beetle in the vicinity of the work area. Coordination with NH Fish & Game has determined no impacts to the Cobblestone tiger beetle are anticipated. To address concerns for Wood turtle rocks will be placed at the outlet to improve wildlife passage through elimination of the perched condition. The project is not prohibited under the ESA Section 4(d) for take of Northern long-eared bat. See documentation within the application.

4.1: Project is within 100-year FEMA Flood Zone. Analysis provided in the application shows the proposed slipline will continue to pass both the 50 and 100 year storm event.

5: The project has been reviewed by the Bureau of Environment (BOE) Cultural Resource Program, and it has been determined ‘No Potential to Cause Effect’ for both above and below ground resources. It was further determined the proposed actions comply with undertakings of Appendix B Certification for Project with ‘Minimal Potential to Cause Effects’ under the Section 106 Programmatic Agreement for non-historic culvert maintenance. This determination concluded there is no effect provided no ground disturbance will occur, to include excavation within 50 feet of Blake Mountain Cemetery, and no disturbance or impacts to the existing stone walls adjacent to the pipe outlet.

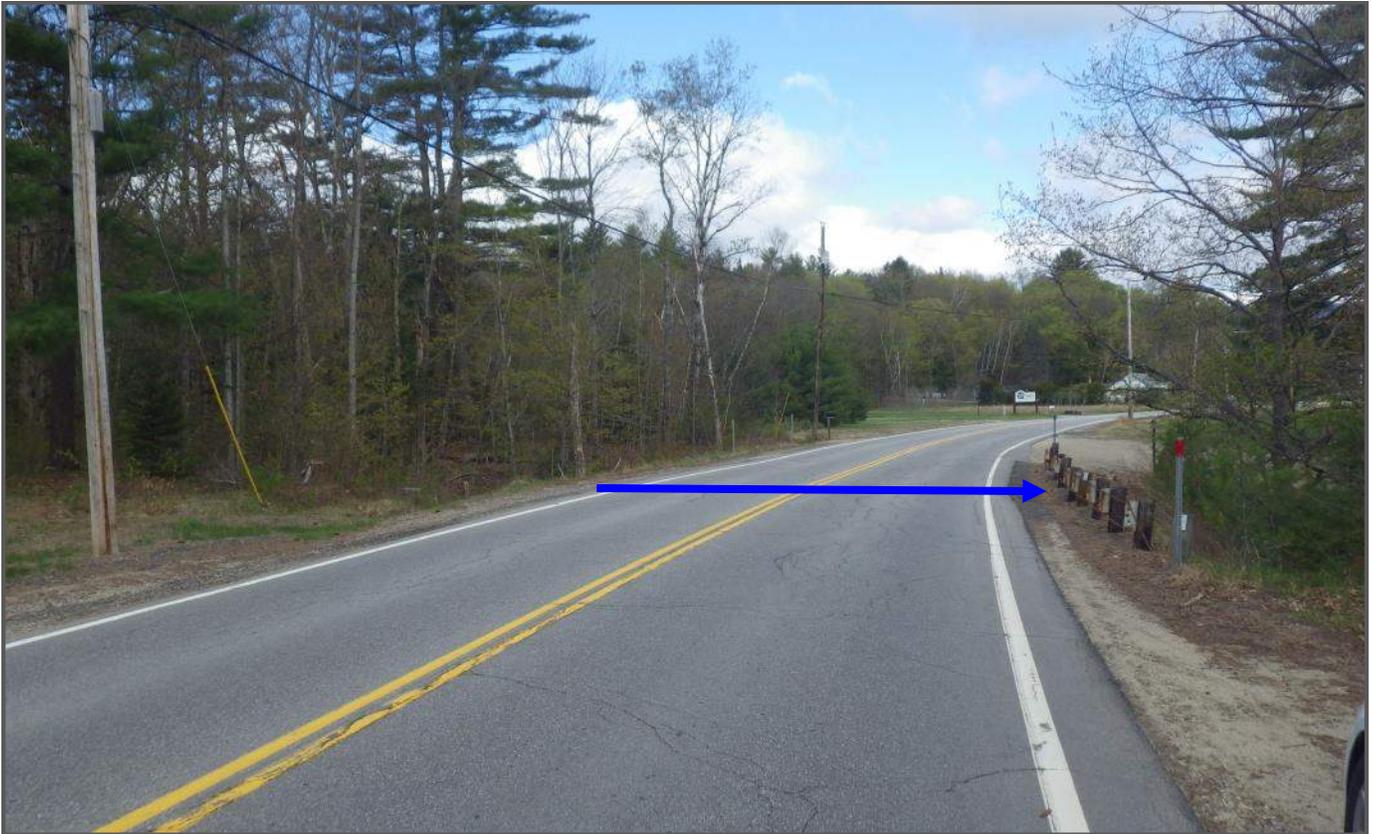


Photo 1: Looking North Down US Route 3



Photo 2: Looking South Down US Route 3

Thornton, Project #2020-M325-1



Photo 3: Looking Upstream from US Route 3



Photo 4: Looking Downstream at Inlet



Photo 5: Looking North Across Inlet



Photo 6: Looking Upstream From Inlet



Photo 7: Looking Downstream from Outlet



Photo 8: Looking Upstream at Outlet



Photo 9: Looking Downstream Toward 'Stilling Pool' from US 3



Photo 10: Looking Upstream Toward Outlet and 'Stilling Pool'

CONSTRUCTION SEQUENCE

Erosion control measures (such as silt fence, compost sock, and hay bales) will be placed between the proposed work area and designated wet areas ahead of all construction activities. All erosion control measures will be installed, monitored, repaired or replaced as needed to maintain water quality and will not be removed until all temporarily impacted areas are stabilized.

The installation of the proposed slipline will take place during a dry period with no flow, which occurs primarily in the summer/early fall months.

20' segments of slipline pipe are inserted (pushed) into the existing pipe one at a time. Once a segment has been inserted, the next segment is connected onto the end of the preceding segment and then pushed into the existing pipe. This process continues until the slipline pipe reaches the length of the existing pipe.

Impacts to the work site shall be temporary in nature and associated with the logistics of inserting the slipline pipe. Inserting the slipline will consist of inserting segments of slipline pipe into the existing pipe and then grouting the space between both pipes with flowable fill grout. Heavy equipment will be located on the south side of the inlet channel, outside of the channel, and will be used to insert the slipline pipe into the existing pipe. The heavy equipment will be located a distance from the jurisdictional wetland area located on the north side of the inlet. Flowable fill grout will be pumped through a hose from a concrete truck, located along the roadway, to the inlet side of the pipe. Impacts to the inlet channel will temporary and minimal (i.e. walking and placing compost sock).

Single-lane alternating two-way traffic pattern will be used on US Route 3 during work hours to allow for staging of slipline materials and concrete delivery.

Work will be completed in 4 days and in three steps:

Step 1 (1 day) - Prepare site for slipline operations

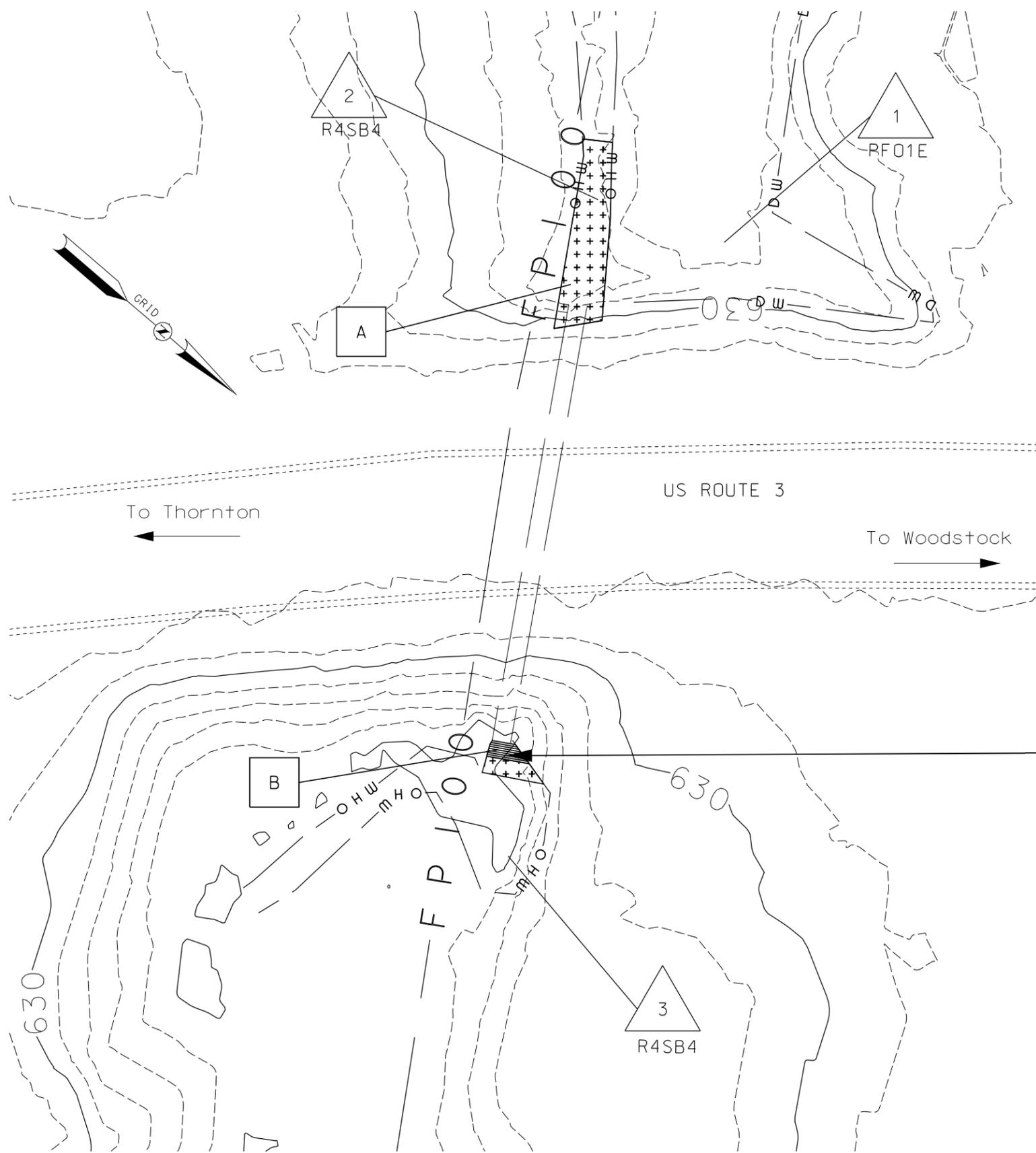
1. Clear any brush that may be in the way of work tasks
2. Clean and prepare the length of the existing pipe, and the pipe's inlet and outlet surface area, for the new slipline and flowable fill grout formwork

Step 2 (2 days) - Insert slipline pipe into existing pipe and grout between pipes

1. Insert the HDPE slipline pipe into the existing pipe
2. Mount grout formwork (with air vents) on the inlet and outlet side of the pipe.
3. Pump flowable fill grout in the space located between the existing pipe and the slipline pipe and allow it to cure in place

Step 3 (1 day) - Restore site to pre-work conditions

1. Remove formwork
2. By-hand, using the stones located beneath the outlet of the pipe along with additional stones, construct stone steps for turtle access to the culvert.
3. Return the all disturbed area to existing conditions
4. If required, seed and mulch the ground impacted by heavy equipment.



RIGHT-OF-WAY NOTE

DISTRICT 3 WILL SECURE A RIGHT-OF-ENTRY FROM PROPERTY OWNERS OF THE PARCELS LOCATED AT THE INLET AND THE OUTLET OF THE PIPE FOR ACCESS TO THE CULVERT AND FOR ANY WORK COMPLETED ON PRIVATE PROPERTY.

LEGEND

TYPE OF WETLAND IMPACT	SHADING/HATCHING	Symbol	Description
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	[Diagonal hatching]	△ #	WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	[Solid grey]	□ #	WETLAND IMPACT LOCATION
TEMPORARY IMPACTS	[Cross-hatching]	◇ #	WETLAND MITIGATION AREA
	[Diagonal hatching]	▨	MITIGATION

WETLAND IMPACT SUMMARY											
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION		
			PERMANENT				TEMPORARY		PERMANENT		
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)		SF	LF	BANK LEFT	BANK RIGHT	CHANNEL
			SF	LF	SF	LF	SF	LF	LF	LF	LF
1	PF01E										
2	R4SB4	A					185	30			
3	R4SB4	B			15	8	24	9			
TOTAL					15	8	209	39			

PERMANENT IMPACTS: 15 SF
 TEMPORARY IMPACTS: 209 SF
 TOTAL IMPACTS: 224 SF

PROPOSED STONE STEPS FOR TURTLE PASSAGE:

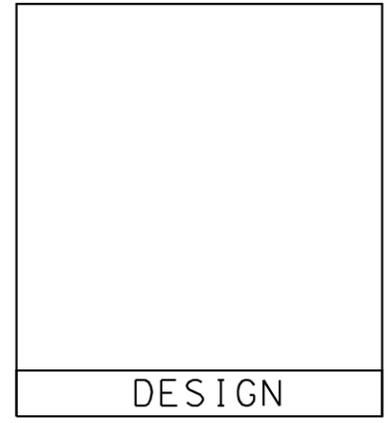
THE EXISTING STONES, LOCATED BENEATH THE CULVERT'S OUTLET, ALONG WITH ADDITIONAL STONES SHALL BE ARRANGED BY HAND TO PROVIDE A NAVIGABLE PATH FOR TURTLES. THE STONE STEP PATH SHALL MATCH INTO EXISTING GROUND.

WETLANDS DELINEATED BY:
 SARAH LARGE & DEIDRA BENJAMIN
 ON MAY 12, 2021



SCALE IN FEET

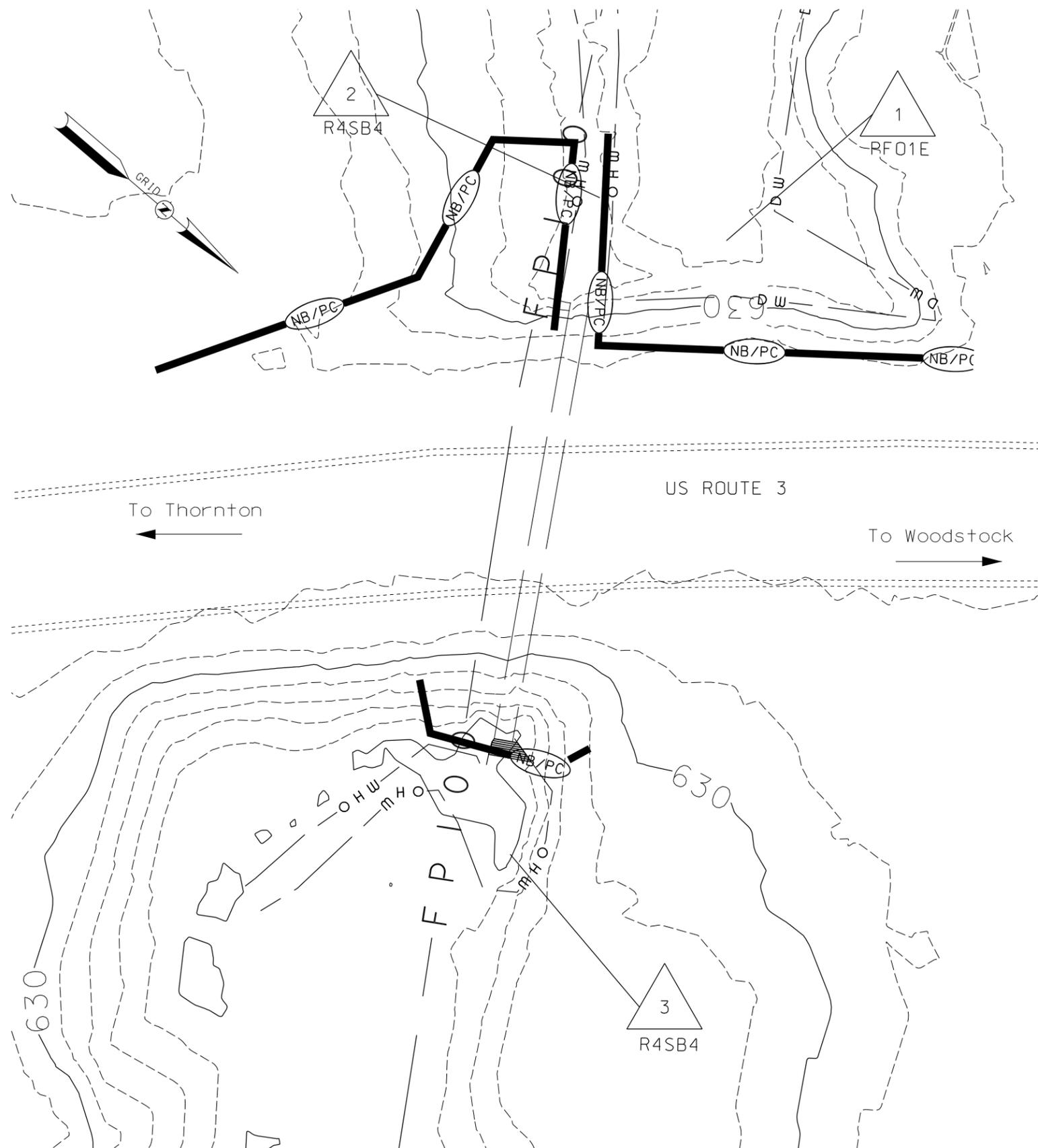
WETLAND IMPACT PLANS
 DATE 07-07-2021



DESIGN

NH DEPARTMENT OF TRANSPORTATION
 HIGHWAY MAINTENANCE DISTRICT 3
 THORNTON - US ROUTE 3
 SLIPLINE OF 36"RCP PIPE
 (2020-M325-1)

FOR NHDOT STANDARD SYMBOLS PLEASE VISIT
<https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/detailsheets/documents/stdsymb1-2.pdf>



RIGHT-OF-WAY NOTE

DISTRICT 3 WILL SECURE A RIGHT-OF-ENTRY FROM PROPERTY OWNERS OF THE PARCELS LOCATED AT THE INLET AND THE OUTLET OF THE PIPE FOR ACCESS TO THE CULVERT AND FOR ANY WORK COMPLETED ON PRIVATE PROPERTY.

WETLANDS DELINEATED BY:
 SARAH LARGE & DEIDRA BENJAMIN
 ON MAY 12, 2021

EROSION CONTROL PLANS
 DATE 07-07-2021

EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
	CLEAN WATER BYPASS PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL

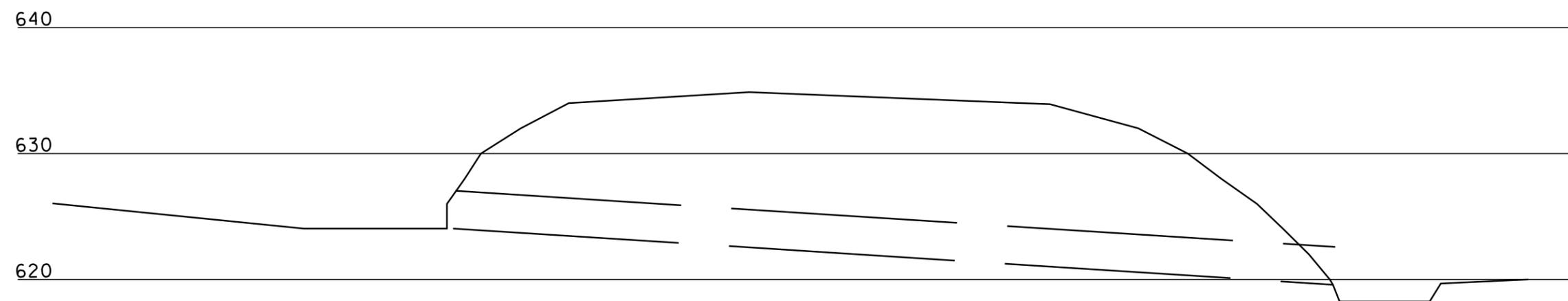
DESIGN



SCALE IN FEET

NH DEPARTMENT OF TRANSPORTATION
 HIGHWAY MAINTENANCE DISTRICT 3
 THORNTON - US ROUTE 3
 SLIPLINE OF 36"RCP PIPE
 (2020-M325-1)

NHDOT DISTRICT 3
THORNTON - SLIPLINE OF 36" RCP
US ROUTE 3 OVER NO NAME BROOK
PROFILE OF EXISTING PIPE



1" = 10'

Thornton Culvert Slip Line, DOT Project #2020-M325-1

June 7, 2021

A letter from the NH Department of Transportation was sent to the Town of Thornton, to include the Selectmen and Conservation Commission, on April 9, 2021. The Conservation Commission reached out to request a site visit. On May 12, 2021 I met with members of the Commission onsite to go over the project and help answer any questions. The Commission responded they have no additional questions or concerns for the project at this time. The Selectmen also provided comment to the letter, and no follow-up was required.

As the project falls on the outer limit of the Pemigewasset River, a NH Designated River, Email communication was sent on May 25th, 2021. A response was received from William Bolton asking if the culvert was evaluated for anticipated volume in a climate change world. See attached correspondence below.

Arin Mills
Bureau of Environment
NHDOT

Mills, Arin

From: Myrtle Lewis <mmlewis34@sbcglobal.net>
Sent: Wednesday, May 12, 2021 11:43 PM
To: Mills, Arin
Cc: Roy Sabourn
Subject: Summary of DOT Culvert Rehabilitation Project on Rt. 3 in Thornton, NH #2020-M325-1

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Arin,

It was a pleasure meeting with you today to review the culvert project by the Blake Mountain Cemetery.

- Present were members of the Thornton Conservation Commission: Myrtle Lewis, Al Lewis, Jerry Sobolewski, Katri Gurney, Maryellen Sakura and Mike Boisvert.
- Arin described the project and provided background information:
 - Arin is the DOT Environmental Manager (biology background)
 - the plan is to install a slip line - a 30" culvert inside the existing 36" culvert
 - The (unnamed stream) is a Tier 1 stream and this is an economical approach to extending the life of culvert
 - This small project will be handled by the local or division group of NH DOT
 - DOT will conduct an assessment of the impacts of this culvert rehabilitation, and will file the wetlands permit application with DES, if necessary (it is probably required)
 - The existing culvert is perched, which indicates the culvert is undersized
 - The hydraulics engineer has estimated that this stream and culvert can withstand the 50 and 100 year storms (there are areas before and after the culvert that can backup and flood, including a stilling basin downstream (and the homeowner built a stone wall)
 - Species of concern in this area are the wood turtle (conservation need) and the cobblestone tiger beetle (State listed). They will look for nesting habitat for wood turtles
 - The culvert area is within 1/4 mile of the Pemi (designated river)
- The Thornton Conservation Commission does not have anything to add regarding the answers to the questions in the April 9, 2021 letter (sent by Arin to Roy Sabourn).

Thanks for your time. It was very appreciated.

Myrtle Lewis
 Chair, Thornton Conservation Commission
 805-279-5144



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

April 9, 2021

RECEIVED
APR 12 2021
BY: [Signature]

Roy Sabourn
Board of Selectmen, Chair
16 Merrill Access Road
Thornton, NH 03285

Re: Thornton Culvert Rehabilitation, #2020-M325-1

Dear Mr. Sabourn:

The NH Department of Transportation (DOT) is planning the subject project, which will entail rehabilitation of an existing 36" Reinforced Concrete Pipe (RCP) which carries US Route 3 over an un-named stream. Work will include rehabilitation of the significantly deteriorated pipe invert which may include slip-lining, although a final proposed design is still in development.

Some transportation projects require mitigation for possible wetland/stream impacts. The natural resources in this project area have not yet been identified and investigations are forthcoming. Preliminary engineering studies have begun and the Department will attempt to avoid, and minimize impacts through design before determining if there will be any stream or wetland impacts that may require mitigation. As a proactive measure the Department would like to request a list of the Town's preferred/priority mitigation efforts that the Department may evaluate and consider undertaking if it is determined that the project does in fact require mitigation. Please let us know if your Town has identified such priorities. In the absence of any Town priorities to evaluate the Department will pursue permittee responsible mitigation through the Stream Passage Improvement Program (SPIP). If it's determined that no viable options exist through the SPIP, the Department will pursue a payment into the Aquatic Resource Mitigation Fund (ARM Fund), at which time those funds will become competitively available through the ARM fund grant process.

Engineering studies have been initiated to refine the scope and limits of work necessary for this project. The Department's Bureau of Environment is in the process of evaluating the potential environmental impacts associated with the project. To assist in this evaluation, I am asking that you provide comments relative to the project's potential impacts on environmental, social, economic or cultural resources, by responding to the following questions.

- NO 1. Does the Town have a list of priority mitigation efforts (Top 10 Priority List) that the DOT may evaluate and consider undertaking if it is determined that the project does in fact require mitigation? If so, please provide the list. (e.g. problematic culvert/bridge crossings, land protection, habitat restoration, etc.)
- NO 2. Are there any existing or proposed community or regional plans that might have a bearing on this project?
- NO 3. Are there any natural resources of significance in the vicinity of the project? (e.g. prime wetlands, floodplains, rare species, etc.) Are there any known wildlife corridors or habitat strongholds in the vicinity of the project?
- NO 4. Are there any cultural resources of significance in the vicinity of the project? (e.g. stonewalls, cemeteries, historical or archeological resources, etc.) *Please note that Section 106 of the National Historic Preservation Act offers those that possess a direct interest in historical resources, including town officials,*

Blake Mtn. Cemetery is adjacent to subject locus.
JOHN O. MORTON BUILDING • 7 HAZEN DRIVE • P.O. BOX 483 • CONCORD, NEW HAMPSHIRE 03302-0483
TELEPHONE: 603-271-3734 • FAX: 603-271-3914 • TDD: RELAY NH 1-800-735-2964 • INTERNET: WWW.NHDOT.COM

Historical Societies, and Historical Commissions, an opportunity to become more involved in an advisory role during project development as "Consulting Parties." Those interested should contact the Department.

- NO 5. Are there any public parks, recreation areas, conservation lands, or wildlife/waterfowl refuges in the vicinity of the project? Have Land & Water Conservation Funds been used in the project area? NO
- NO 6. Are there any locally or regionally significant water resources or related protection areas in the project vicinity? (e.g. public water supplies, wellhead protection areas, aquifer protection districts, etc.)
- NO 7. Are there any water quality concerns that should be addressed during the development of this project? (e.g. stormwater management, NPDES Phase II, impaired waters, etc.)
- NO 8. Are you aware of any existing or potential hazardous materials or contaminants in the vicinity of the project? Are there asbestos landfills or asbestos containing utility pipes located within the project limits? NO
- NO 9. Do you have any environmental concerns not previously noted (e.g. noise impacts, farmland conversion, etc.) that you feel the Department should be aware of for this project?
- NO 10. Will the proposed project have a significant effect upon the surrounding area? If so, please explain.
11. Are you aware of any existing roadside populations of non-native invasive plant species (such as Japanese knotweed, phragmites, or purple loosestrife) in the project area? NO, but poison ivy is present on inlet side.

This letter has been sent to the following departments, boards, and/or commissions:

- Board of Selectmen
 - Planning Board
 - Town Administrator
 - Fire Department
 - Police Department
 - Road Agent
 - Conservation Commission
- received from 4-21-21*

The tentative construction date for this project is Fall 2021, pending necessary permits. Please feel free to contact me if you have any questions or require further information regarding the above referenced project. Thank you for your assistance.

Sincerely,



Arin Mills
Senior Environmental Manager
NH Department of Transportation
Bureau of Environment
271-3226
Arin.j.mills@dot.nh.gov

AJM:ajm
Encl.

Mills, Arin

From: Mills, Arin
Sent: Thursday, May 27, 2021 10:54 AM
To: 'William Bolton'
Cc: Myrtle Lewis
Subject: RE: DOT Culvert Rehab Thornton 2020-M325-1 PRLAC Coordination

Bill,

Thanks for reaching out and putting this on your agenda. This project will seek a wetlands permit from DES to conduct the work. The Department has collected the field data, and the impact/design plans are still under development. Once those are complete we will have a clear understanding of the permit classification and requirements. This un-named stream is classified as a Tier 1 crossing under Env-Wt 904.03 and likely intermittent based on field observations and communication with the adjacent landowner. As such, it is anticipated the design will meet Env-Wt 904.08 for repair of a Tier 1 crossing as required by rule.

That said, the permit will include hydraulic capacity analysis to ensure it will meet the rules to pass a 50-year design storm under the proposed slip line. The slip line project is designed to be a rehabilitation of the crossing that will maintain the safety of the traveling public in a cost effective manner. This type of rehab is allowed once under the rule, and the proposed solution given the depth of the pipe beneath the roadway.

If you are referring to the NH SADES data collection, it does not appear this location has been reviewed as part of that effort based on online viewer. This site was identified in need of repair through our District 3 office, and they will be conducting the repair, once approved.

Let me know if you have any specific questions I can help you with, but I hope this helps you understand our design approach a bit better. Feel free to reach out!

~ Arin

From: William Bolton <wbolton@live.com>
Sent: Wednesday, May 26, 2021 9:24 PM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Cc: Myrtle Lewis <mmlewis34@sbcglobal.net>
Subject: RE: DOT Culvert Rehab Thornton 2020-M325-1 PRLAC Coordination

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Arin, do you know if this culvert has been recently evaluated for anticipated volume in a climate changed world? I know many culverts have already been inspected and reviewed...

Bill

From: William Bolton
Sent: Tuesday, May 25, 2021 4:04 PM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Cc: Myrtle Lewis <mmlewis34@sbcglobal.net>
Subject: RE: DOT Culvert Rehab Thornton 2020-M325-1 PRLAC Coordination

Arin, thank you for bringing this to my attention. We have a Pemigewasset River Local Advisory Committee meeting this evening, and I'll bring your project up for discussion and get back to you.

Bill

William Bolton
Chair, PRLAC
603-236-1812 (c)

From: Mills, Arin [<mailto:Arin.J.Mills@dot.nh.gov>]
Sent: Tuesday, May 25, 2021 11:23 AM
To: 'wbolton@live.com' <wbolton@live.com>
Subject: DOT Culvert Rehab Thornton 2020-M325-1 PRLAC Coordination

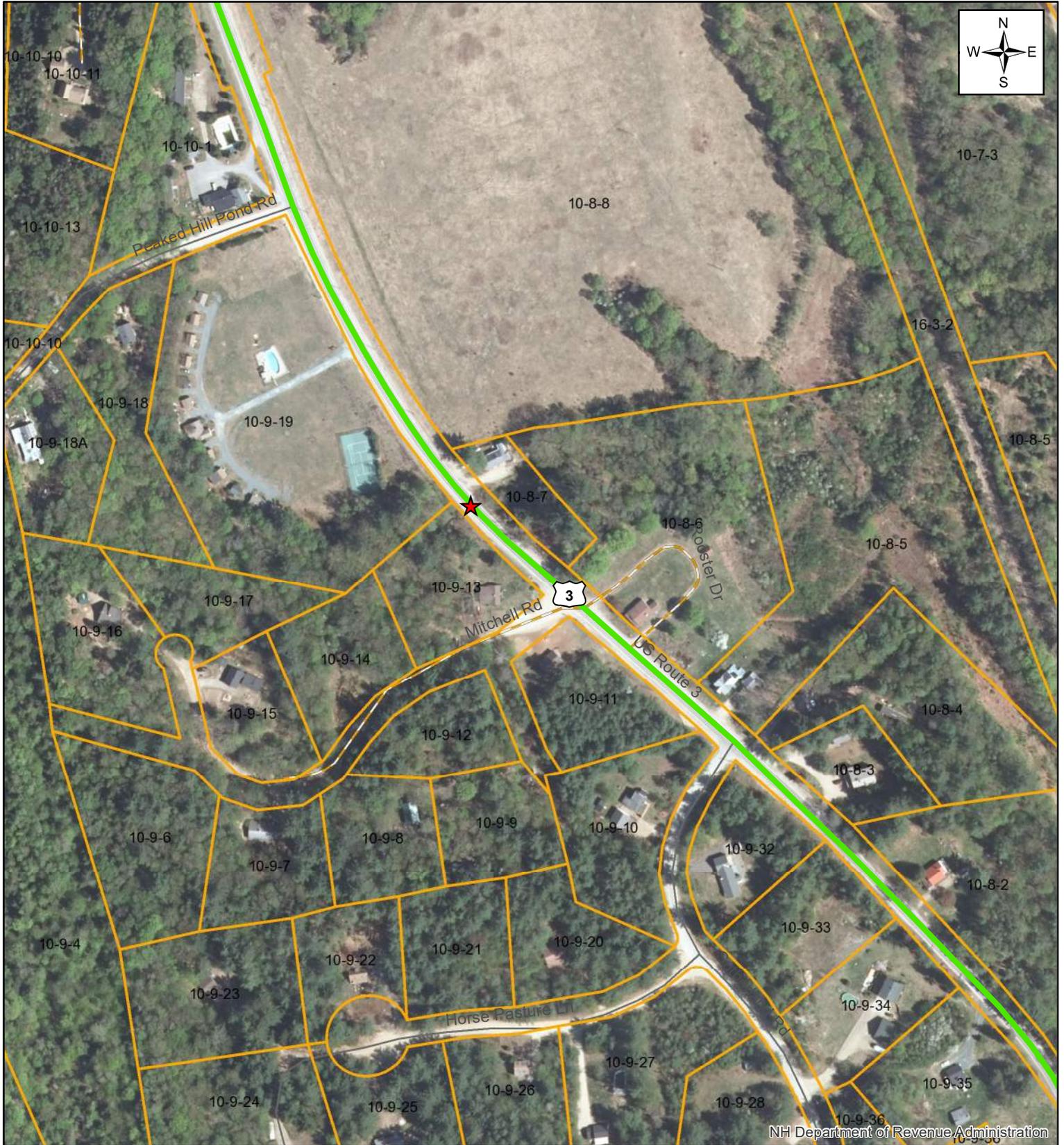
William,

The NHDOT is proposing culvert rehabilitation to a 36" RCP which carries US Route 3 over an un-named tributary to the Pemigewasset River, see attached map for location. At this time the proposed work is to slip line the existing culvert with a 30" HDPE pipe to extend the life of the existing pipe. The Department will seek a permit from NHDES to conduct the work, and as such you will be given the opportunity to comment on the wetlands application as the project falls on the outer limit of the ¼ mile buffer. We are still under development of the wetlands application package at this time, but wanted to reach out to see if you have any specific concerns for the project as it relates to your program. If you are aware of any resources (such as natural or cultural) we should consider we appreciate your input as we continue to develop the proposed project plans.

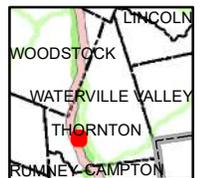
Feel free to reach out if you have any additional questions or comments you may have.

Arin Mills
Senior Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov

Thornton, #2020-M325-1



1:3,000



Legend

- ★ Project Location
- Parcels - polygons
- State Routes

Map depicting project 2020-M325-1 in Thornton for rehabilitation of existing 36" culvert.

Map created by: Arin Mills on 3/24/2021

Source: S:\Environment\PROJECTS\THORNTON\2020-M324-04

Town of Thornton

Print Now

Parcel ID: 000010 000009 000013 (CARD 1 of 1)
 Owner: ALLAIN, GERALD
 Location: 6 MITCHELL RD
 Acres: 1.100

General

Valuation		Listing History		Districts	
Building Value:	\$91,800	<u>List Date</u>	<u>Lister</u>	<u>District</u>	<u>% In Dist.</u>
Features:	\$9,000	01/15/2019	JDVM	WV ESTATES	0
Taxable Land:	\$60,200	07/27/2016	DWVL		
<hr/>		09/17/2012	DWVM		
Card Value:	\$161,000	07/13/2012	INSP		
Parcel Value:	\$161,000	02/12/2007	DWVL		
Review and Pay Property Taxes Online					

Notes: NAT; LOG HOME; INT OF HOME IN GOOD COND, NEW INT RENO AT TIME OF ADDITION; UPGRADED PLB & ELEC; 7/16 ADJ OUTBLDG DIMENSION; ADDED FPL & 2ND EXT SIDING; ALL INT INFO @ DOOR, DOG & CHILD; 1/19; NOH; PU PAT;

History Of Taxable Values

Tax Year	Building	Features	Land	Value Method	Total Taxable
2019	\$91,800	\$9,000	\$60,200	Cost Valuation	\$161,000
2018	\$86,200	\$6,900	\$42,400	Cost Valuation	\$135,500
2017	\$86,200	\$6,900	\$42,400	Cost Valuation	\$135,500
2016	\$86,200	\$6,900	\$42,400	Cost Valuation	\$135,500
2015	\$87,100	\$1,900	\$42,400	Cost Valuation	\$131,400
2014	\$87,100	\$1,900	\$42,400	Cost Valuation	\$131,400
2013	\$96,300	\$2,200	\$36,200	Cost Valuation	\$134,700
2012	\$96,300	\$2,200	\$36,200	Cost Valuation	\$134,700
2011	\$96,300	\$3,600	\$36,200	Cost Valuation	\$136,100
2010	\$96,300	\$3,600	\$36,200	Cost Valuation	\$136,100
2009	\$96,300	\$3,600	\$36,200	Cost Valuation	\$136,100
2008	\$97,400	\$4,900	\$30,800	Cost Valuation	\$133,100
2007	\$97,400	\$4,900	\$30,800	Cost Valuation	\$133,100
2006	\$93,600	\$5,500	\$30,800	Cost Valuation	\$129,900

Sales

Sale Date	Sale Type	Qualified	Sale Price	Grantor	Book	Page
03/25/2019	IMPROVED	NO - INDETERMINATE PRICE	\$0	GOLDING, REBECCA R	4423	0067
10/22/2018	IMPROVED	YES	\$151,200	DIEMAND SAMANTHA L	4396	0108
09/26/2018	IMPROVED	NO - FAMILY/RELAT GRNTR/E	\$1	BUSWELL LORI A & DIEMAND SAMANTHA L	4390	0360
04/24/2015	IMPROVED	NO - DEED TO QUIET TITLE	\$107,000	UNION BANK	4123	0667
02/04/2015	IMPROVED	NO - FORECLOSURE	\$90,000	GORDON FRANCIS E &	4109	0526
05/03/2001	IMPROVED	NO - LNDLRD/TENANT SALE	\$50,000	REDMOND DANNA & JOELLE	2535	0228

Land

Size: 1.100 AC. **Site:** AVERAGE
Zone: 06 - INDUSTRIAL I **Driveway:** GRAVEL/DIRT
Neighborhood: AVG -10 **Road:** GRAVEL/DIRT
Land Use: 1F RES **Taxable Value:** \$60,200

Land Type	Units	Base Rate	NC	Adj	Site	Road	Dway	Topo	Cond	Ad Valorem	SPI	R	Tax Value	Notes
1F RES	1.000 AC	74,000	D	90	100	95	95	100 LEVEL	100	60,100	0	N	60,100	
1F RES	0.100 AC	1,000	X	100	0	0	0	100 LEVEL	100	100	0	N	100	

Building

1.00 STORY LOG HOME Built In 1969

Roof: GABLE HIP ASPHALT	Bedrooms: 3	Quality: AVG
Exterior: LOGS WOOD SHINGLE	Bathrooms: 1.0	Size Adj. 1.0917
Interior: WOOD/LOG DRYWALL	Extra Kitchens: 0	Base Rate: 90.00
Flooring: CARPET	Fireplaces: 0	Building Rate: 1.0044
Heat: GAS FA NO DUCTS	Generators: 0	Sq. Foot Cost: 90.39
	AC: NO	Effective Area: 1,181
		Gross Living Area: 1,108
	Cost New: \$106,751	

Normal GOOD	Physical	Functional	Economic	Temporary	Total Dpr.	Assessment
14%	0%	0%	0%	0%	14%	\$91,800

Features

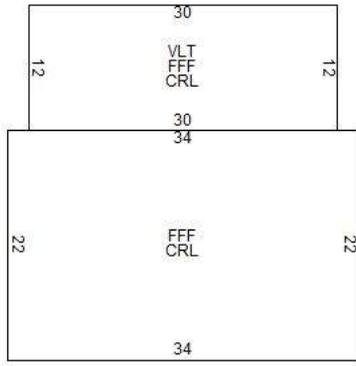
Feature Type	Units	Length x Width	Size Adj	Rate	Cond	Value	Notes
SHED-EQUIPMENT	70	10 x 7	289	8.00	60	\$971	
SHED-WOOD	210	10 x 21	136	10.00	60	\$1,714	ATT TO 10 X 7
FIREPLACE 1-CUST	1		100	5000.00	100	\$5,000	
PATIO	240	30 x 8	127	7.00	60	\$1,280	CONC/ATT HSE
Total:						\$9,000	

Photo



Sketch

Code	Description	Area	Eff Area	GL Area
VLT	VAULTED	360	18	0
Totals			1,181	1,108



Code	Description	Area	Eff Area	GL Area
CRL	CRAWL SPACE	1,108	55	0
FFF	FST FLR FIN	1,108	1,108	1,108
Totals			1,181	1,108

Printed on 04-08-21

Town of Thornton

[Print Now](#)

Parcel ID: 000010 000008 000007 (CARD 1 of 1)
 Owner: SUTTON PATRICKI N
 LINDA SUTTON
 Location: 2886 US RTE 3
 Acres: 0.500

General

Valuation	
Building Value:	\$92,300
Features:	\$400
Taxable Land:	\$68,400
<hr/>	
Card Value:	\$161,100
Parcel Value:	\$161,100
Review and Pay Property Taxes Online	

Listing History	
List Date	Lister
09/17/2012	DWVM
07/13/2012	INSP
07/23/2007	MVVL
07/11/2002	GRHC
06/21/2002	MVHL

Districts	
District	% In Dist.
WV ESTATES	0

Notes: INT INFO EST FROM EXT INSP

History Of Taxable Values

Tax Year	Building	Features	Land	Value Method	Total Taxable
2019	\$92,300	\$400	\$68,400	Cost Valuation	\$161,100
2018	\$86,600	\$300	\$49,700	Cost Valuation	\$136,600
2017	\$86,600	\$300	\$49,700	Cost Valuation	\$136,600
2016	\$86,600	\$300	\$49,700	Cost Valuation	\$136,600
2015	\$86,600	\$300	\$49,700	Cost Valuation	\$136,600
2014	\$86,600	\$300	\$49,700	Cost Valuation	\$136,600
2013	\$99,600	\$300	\$40,400	Cost Valuation	\$140,300
2012	\$99,600	\$300	\$40,400	Cost Valuation	\$140,300
2011	\$91,000	\$200	\$40,400	Cost Valuation	\$131,600
2010	\$91,000	\$200	\$40,400	Cost Valuation	\$131,600
2009	\$91,000	\$200	\$40,400	Cost Valuation	\$131,600
2008	\$83,400	\$200	\$57,800	Cost Valuation	\$141,400
2007	\$83,400	\$200	\$57,800	Cost Valuation	\$141,400
2006	\$80,200	\$200	\$57,800	Cost Valuation	\$138,200

Sales

Sale Date	Sale Type	Qualified	Sale Price	Grantor	Book	Page
10/28/2011	IMPROVED	YES	\$120,000	LAVERY BRIAN	3830	0860
07/17/2007	IMPROVED	YES	\$95,000	OCHS, CLIFFORD	3428	0680
06/19/2002	IMPROVED	NO - FAMILY/RELAT GRNTR/E	\$0	PIERCE DARLENE	2679	0373

Land

Size:	0.500 Ac.	Site:	AVERAGE
Zone:	03 - COMMERCIAL	Driveway:	GRAVEL/DIRT
Neighborhood:	AVE	Road:	PAVED
Land Use:	1F RES		

Taxable Value: \$68,400

View Description: HILLS, AVERAGE, TOP25%, CLOSE

Land Type	Units	Base Rate	NC	Adj	Site	Road	Dway	Topo	Cond	Ad Valorem	SPI	R	Tax Value	Notes
1F RES	0.500 AC	68,000	E	100	100	100	95	95 MILD	100	61,400	0	N	61,400	
VIEW					0	0	0			7,000	0	N	7,000	pl obst

Building

1.50 STORY CONVENTION Built In 1945

Roof:	GABLE HIP ASPHALT	Bedrooms:	2	Quality:	AVG
Exterior:	ASBEST SHNGL	Bathrooms:	1.0	Size Adj.	1.0482
Interior:	PLYWOOD PANEL	Extra Kitchens:	0	Base Rate:	90.00
Flooring:	CARPET	Fireplaces:	0	Building Rate:	0.9132
Heat:	OIL FA DUCTED	Generators:	0	Sq. Foot Cost:	82.19
		AC:	NO	Effective Area:	1,353
				Gross Living Area:	1,050
				Cost New:	\$111,203

Depreciation	Normal GOOD	Physical	Functional	Economic	Temporary	Total Dpr.	Assessment
	17%	0%	0%	0%	0%	17%	\$92,300

Features

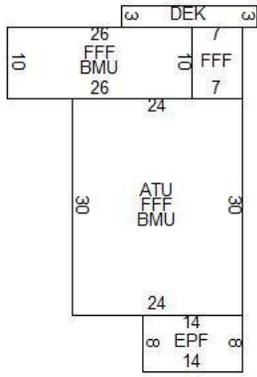
Feature Type	Units	Length x Width	Size Adj	Rate	Cond	Value	Notes
SHED-WOOD	49	7 x 7	387	10.00	20	\$379	
Total:						\$400	

Photo



Sketch

Code	Description	Area	Eff Area	GL Area
DEK	DECK/ENTRANCE	57	6	0
ATU	ATTIC UNFINISHED	720	72	0
EPF	ENCLOSED PORCH	112	78	0
FFF	FST FLR FIN	1,050	1,050	1,050
BMU	BSMNT UNFINISHED	980	147	0
Totals			1,353	1,050



Printed on 04-08-21

U.S. Department of
Homeland Security

United States
Coast Guard



Commander (dpb)
First Coast Guard District

One South Street
Battery Park Building
New York, NY 10004-1466
Staff Symbol: dpb
Phone: (212) 514-4330
Email: Dale.K.Lewis2@uscg.mil

April 2, 2021

NH Department of Transportation
Bureau of Environment
Attn: Ms. Arin Mills
Environmental Manager
7 Hazen Drive
Concord, NH 03302
Arin.j.mills@dot.nh.gov

via e-mail

Re: NV-1086: US Route 3 over Unnamed Stream; NH Route 153(culvert) over Unnamed Stream; NH Route 153 over Unnamed Stream; River Road over Great Brook

Dear Ms. Mills,

This is in response to your letter dated April 1, 2021 and corresponding information requesting whether the Coast Guard will require permits for the referenced bridge projects. We have examined the proposed project areas with regard to their status as navigable waterways of the United States for purposes of Coast Guard bridge jurisdiction.

Our examination indicates that there is no sufficient factual support for concluding that the Unnamed Stream, Thornton, NH, the Unnamed Stream, Eaton, NH, the Unnamed Stream, Wakefield, NH, and Great Brook, Bridgewater, NH at the project locations, have current or historic navigation occurring on these waters of the United States. Since this is the case, Coast Guard bridge permits or exemptions will not be required for the referenced bridge projects.

If you have any questions feel free to contact this office at the number above.

Sincerely,

D. A. Fisher
Bridge Program Manager
U.S. Coast Guard
By direction

E-Copy: 1) USCG Sector Northern New England, Waterways
2) USACE, New England Division, Navigation Section

Mills, Arin

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Thursday, April 1, 2021 11:55 AM
To: Fisher, Donna A CIV
Cc: Lewis, Dale K CIV; Stieb, Jeffrey D CIV
Subject: [Non-DoD Source] USCG Review- Culvert Work NHDOT District 3
Attachments: Wakefield_Topo.pdf; Wakefield_2019-M312-1.zip; Thornton_2020-M325-1_Topo.pdf; Thornton_2020-M324-4.zip; Eaton_1832H-1.zip; Loc Map Eaton NH 153 over the inlet to Crystal Lake Culvert.pdf; Bridgewater_2020-M324-02_Topo.pdf; Bridgewater_2020-M324-2.zip

Hello Donna,

NHDOT is proposing to conduct repair/replacement to the various stream crossings in District 3 and requests your review. To streamline the review, I have included multiple project locations with details below on each site. I have further provided a location map for each, as well as GIS data to assist with your review. Please review from your agency perspective and let me know if you have any concerns for any of the projects as described below. Each of these projects intends to be constructed by District forces, and will very likely require a wetland permit from NHDES to conduct the work.

Thornton, 2020-M325-1: Repair an existing 36" RCP which carries US 3 over an un-named stream in Thornton. Work will include repairs to address invert deterioration with possible slip-lining.

Eaton, 1832-H-1: Replacement of the existing stone culvert which carries NH 153 over an un-named stream which is a tributary to Crystal Lake.

Wakefield, 2019-M312-1: Replacement of existing CMP which carries NH 153 over an un-named stream which is a tributary to the south end of Belleau Lake in Wakefield. Work will also replacement of headwalls and address beaver activity in the area.

Bridgewater, 2020-M324-2: Repair and existing twin 36" RCP which carries River Road over Great Brook in Bridgewater. A design is still in development, but may include possible slip-lining or possible replacement.

Thanks, and feel free to reach out with any questions.

Arin Mills
Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov

ff1



FHOG

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2666 2666	XWUH8QD VLRQ/\$DQD 8KDPHJRRG EPUG =FCH;
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2666 2666	\$JHZ'WKJRRG\$VNGHWRH#H =FCH'
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2666 2666	(HFWLYH#V
2666 2666	\$JDR 8G#WHUHQGJRRG EPUG =FCH'
666 666	8KQD 8OYHUW RU 8VRUR#ZU
666 666	H#H LNH RU JRRGDO
666 666	8JRV 8FVLRQ/ Z'WK\$DQD 8KDPH
666 666	DVHU 8UIDH OHYDVLRLQ
666 666	8DWD 7UDQ#FW
666 666	%DVHJRRG OHYDVLRLQ%
666 666	LEW R 8VXG
666 666	-XULVLFVLRQ%8QDUA
666 666	8DWD 7UDQ#FW %DHLQH
666 666	8JROH%DHLQH
666 666	8JRUDBLF#DVUH
666 666	L'LWDD DWD\$DLODEOH
666 666	RL'LWDD DWD\$DLODEOH
666 666	8DSS-G
666 666	7#HSLQGL VSDHGRQWKHESLV DQDSSJRLBWH SRLQV V#OHFWHG#WKH#X#J DQGGRV CRW UH#H# DQD#KULWDLV YH#S#R#U#W#O#F#D#L#R#

7#LV B#F#D#L#V#Z'WK#J#V#W#D#D#U#G#IRU#WKH#X#H#R#
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7#H#I#O#R#G#K#Q#G#L#Q#R#B#L#R#L#V#G#H#L#Y#G#L#U#H#F#W#O#I#U#R#W#H#
 D#V#K#L#W#D#L#Y#H#Z#E#V#H#L#F#V#S#R#L#G#B#J#7#L#V#B#S#
 Z#V#H#R#U#W#H#G#R#D#V#3#D#G#G#R#V#C#R#W#
 U#H#O#H#W#F#O#Q#H#V#R#U#D#Q#Q#W#V#E#H#X#Q#V#W#R#W#L#V#G#D#H#D#G#
 W#L#F#7#H#J#D#G#H#H#F#W#Y#L#Q#R#B#L#R#Q#B#F#O#Q#H#R#U#
 E#F#F#V#S#U#H#G#B#E#Q#Z#G#D#V#D#R#H#U#W#L#F#

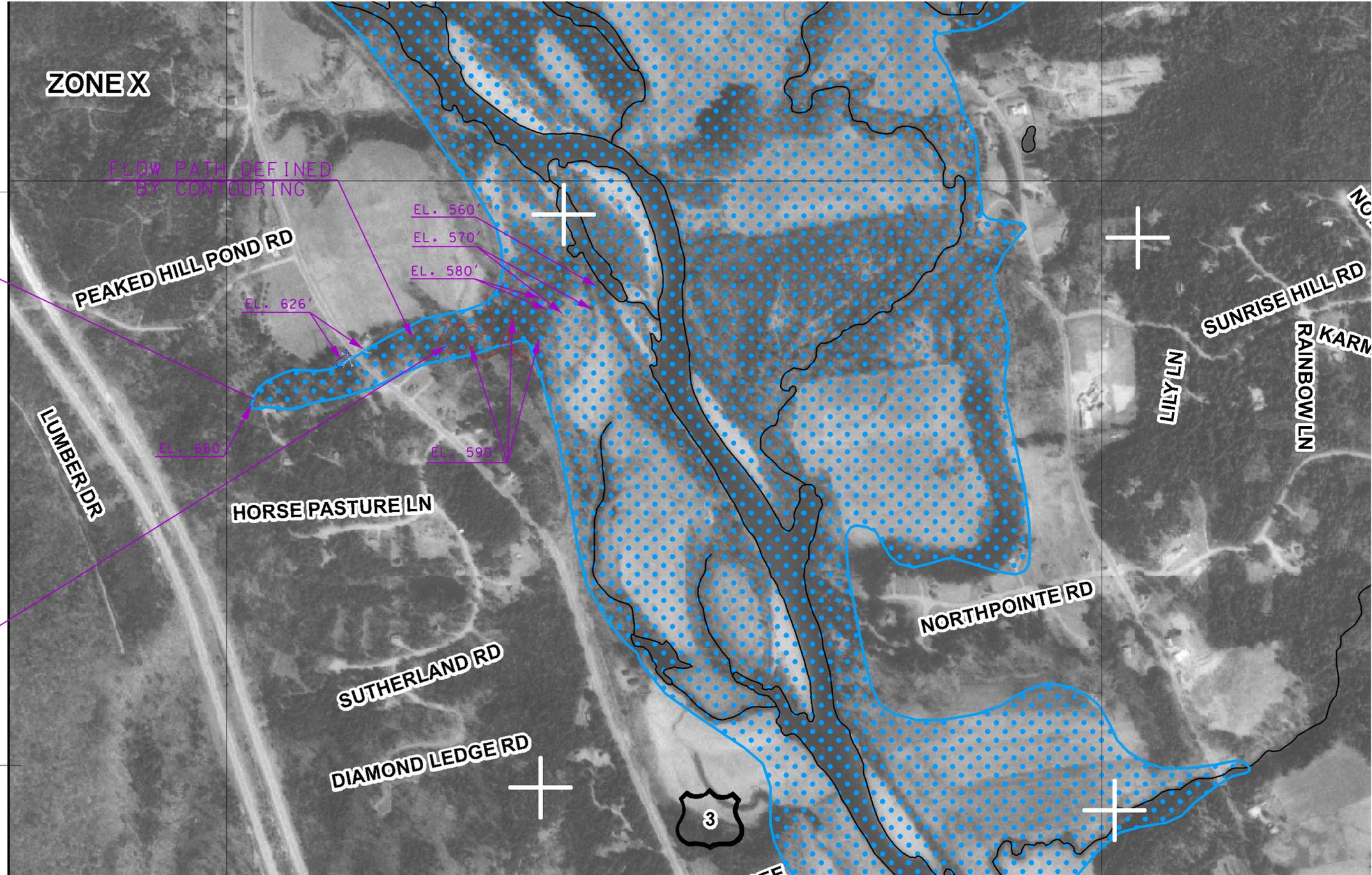
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)#S#S#Q#H#Q#E#H#U#D#G#)8#H#F#W#L#Y#G#D#M#D#S#L#B#H#I#R#U#
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 U#H#O#D#M#R#U#S#U#R#H#V#

THIS BASE MAP IS FIRM
MAP NO. 3309C0645E
EFFECTIVE DATE OF
FEBRUARY 20, 2008

THIS AREA WOULD HAVE TO BE AT
AN ELEVATION OF APPROXIMATELY
590' AND LOWER TO FUNCTION
AS PART OF THE PEMIGEWASSET
RIVER'S 100 YEAR FLOODPLAIN.

THE LIMIT OF THE 100 YEAR FLOODPLAIN
AS DEFINED BY A GROUND ELEVATION
OF 590' (RED LINE).

510000 FT



JUSTIFICATION FOR TIER 1 CLASSIFICATION

This crossing has the following characteristics:

1. Catchment area: 32.7 acres, or 0.05 square miles
2. The stream is intermittent; once storm water flow abates, the stream is dry. Moreover, the USGS map for this jurisdictional area does not show a stream at this location.
3. The project is adjacent to a PRA: A Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded/Saturated (PFO1E) wetland has been delineated on the north side of the inlet channel. This wetland is located within a FEMA FMIS Map designated 100-year floodplain and as such, changes the classification of the crossing to a Tier III. No impacts to the PFO1E are proposed.

Justification to classify crossing as a Tier I crossing:

1. The FEMA FMIS Map for this jurisdictional area does not contain base flood elevations.
2. Using LIDAR, an engineer conducted topographic contour analysis of the area determined that the crossing outlet invert is located at an elevation of approximately 30’ above the Pemigewasset River’s 100-year floodplain.
 - The outer limits of the Pemigewasset River’s Floodplain Path adjacent to the location where it appears that the crossing’s stream meets the Floodplain is at an elevation below 590’, see attached figure.
 - The crossing’s stream reaches an elevation of 590’ (which is an elevation above the Floodplain Path) approximately 500’ downstream of the crossings outlet.
 - The elevation of the proposed slipline outlet invert is 619.83’, which is approximately 30’ above the Pemigewasset River’s 100-year flood path.

Floodplains are like area bowls; and they do change elevation as they flow downstream. However, for an area to be considered part of that floodplain “bowl” it has to be at an elevation at or very near the elevation of the floodplain adjacent to the area. This crossing, and its surrounding area, is located at an elevation significantly higher than the floodplain “bowl” so it cannot be considered part of the Pemigewasset River’s floodplain. Removing that 100-year floodplain designation to the project area changes the Classification of this crossing to a Tier I.

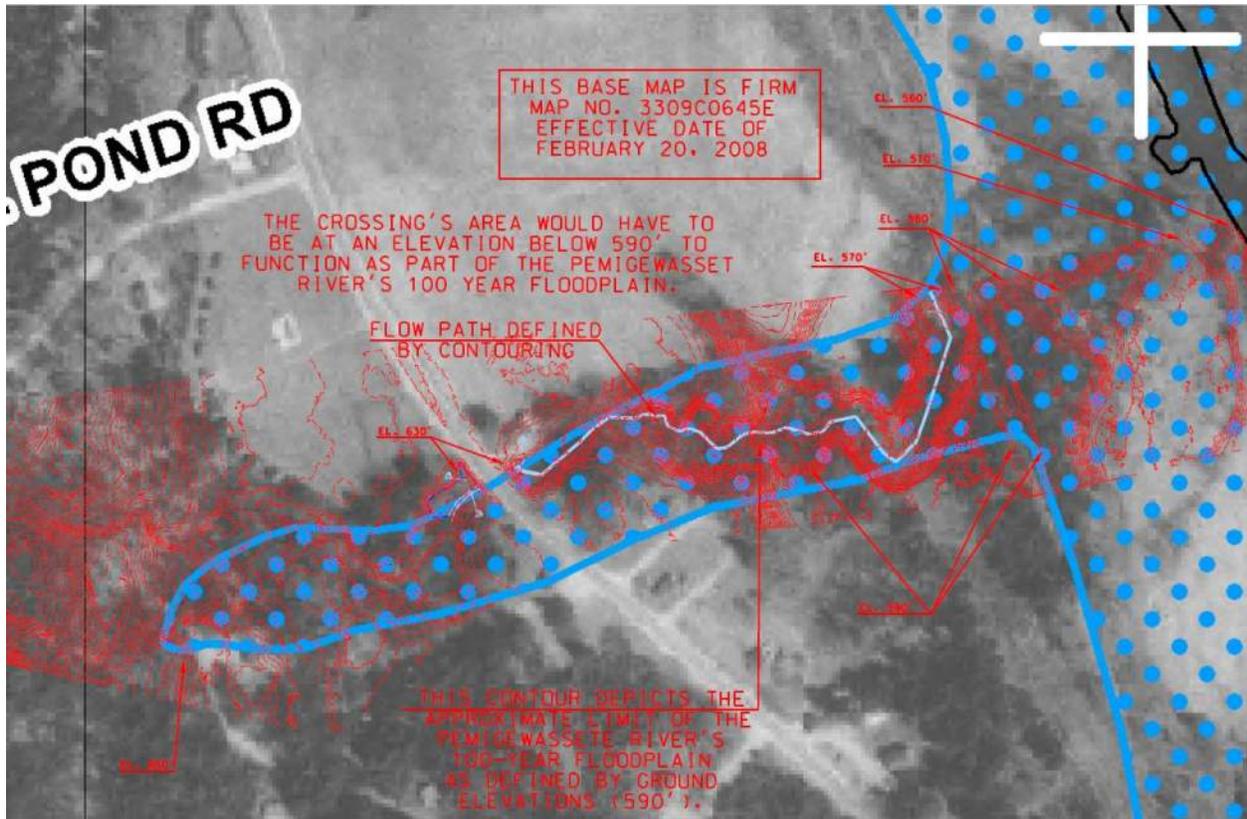


Figure 1 - Plan contain contour analysis

Summary of Drainage Analysis

The Rational Method was used to determine this crossing’s peak flows as this is the preferred method to use when the size of a catchment area is 200AC or less. The catchment area draining to this culvert is approximately 32.7 AC in size. The Rational Method consists of solving the Formula $Q = CIA$, where Q is the peak flow, C is the runoff coefficient, I is rainfall intensity based on the time of concentration, and A is area in acres.

For this location, an average runoff coefficient, C, of 0.33135 was calculated based on both pervious and impervious surfaces and cover.

This location’s storm rainfall intensity (I) charts were downloaded from the Northeast Regional Climate Center, so they reflect current storm intensity trends. The Kirby Method for overland flow and the Kirpich Method for channel flow were used to determine the time of concentration of 33 minutes, which determined the intensity used to determine Peak Flows, see table below:

Storm Intensities for a time of concentration of 33 minutes and Peak Flows

Storm	Intensity (in/hr)	Flows (cfs)
2-year	1.46	15.83
5-year	1.78	19.30
10-year	2.08	22.56
25-year	2.56	27.76
50-year	2.98	32.32
100-year	3.48	37.74

Due to the simplicity of this crossing, the Federal Highway Administration’s (FHWA’s) software HY-8 was used to evaluate both the existing and proposed capacity of this crossing. The table below contains results of the HY-8 analysis performed on the crossing using the Peak Flows noted above and the following criteria:

- Existing and proposed length of 70.5’
- Existing and proposed crest elevation of 634.87’ (elevation of the roadway)
- Existing and proposed inlet geometry of square edge with headwall
- Existing Pipe is 36” RCP; proposed slipline pipe is 30” corrugated plastic pipe.
- Existing Manning’s roughness is 0.012; proposed roughness is 0.024.
- Existing Inlet Invert is 624.04’; proposed inlet invert is 624.29
- Existing Outlet Invert is 619.58; proposed outlet invert is 619.83

Results of the HY-8 analysis on the proposed slipline pipe does not show a significant increase in this crossing’s outlet velocity, even under the 100-year storm. Also, for the 100-year storm, the elevation of storm water at the inlet (628.18’), does not impact upstream properties.

HY-8 RESULTS FOR RATIONAL METHOD PEAK FLOWS

STORM	PEAK FLOW (CFS)	EXISTING		PROPOSED ROUGH LINER	
		INLET CONTROL DEPTH (FT)	OUTLET VELOCITY (FT/S)	INLET CONTROL DEPTH (FT)	OUTLET VELOCITY (FT/S)
2-YEAR	15.83	1.73	5.39	1.89	5.72
5-YEAR	19.30	1.96	5.72	2.16	6.16
10-YEAR	22.56	2.17	6.04	2.42	6.54
25-YEAR	27.76	2.48	6.51	2.86	7.16
50-YEAR	32.32	2.74	6.59	3.30	7.73
100-YEAR	37.74	3.07	7.35	3.89	8.46
		FLOW (CFS)	DEPTH (FT)	FLOW (CFS)	DEPTH (FT)
	MAXIMUM CAPACITY	105.28	10.83	72.44	10.58